

THE
BOOK OF
MIGRATORY
BIRDS

W. HALLIDAY

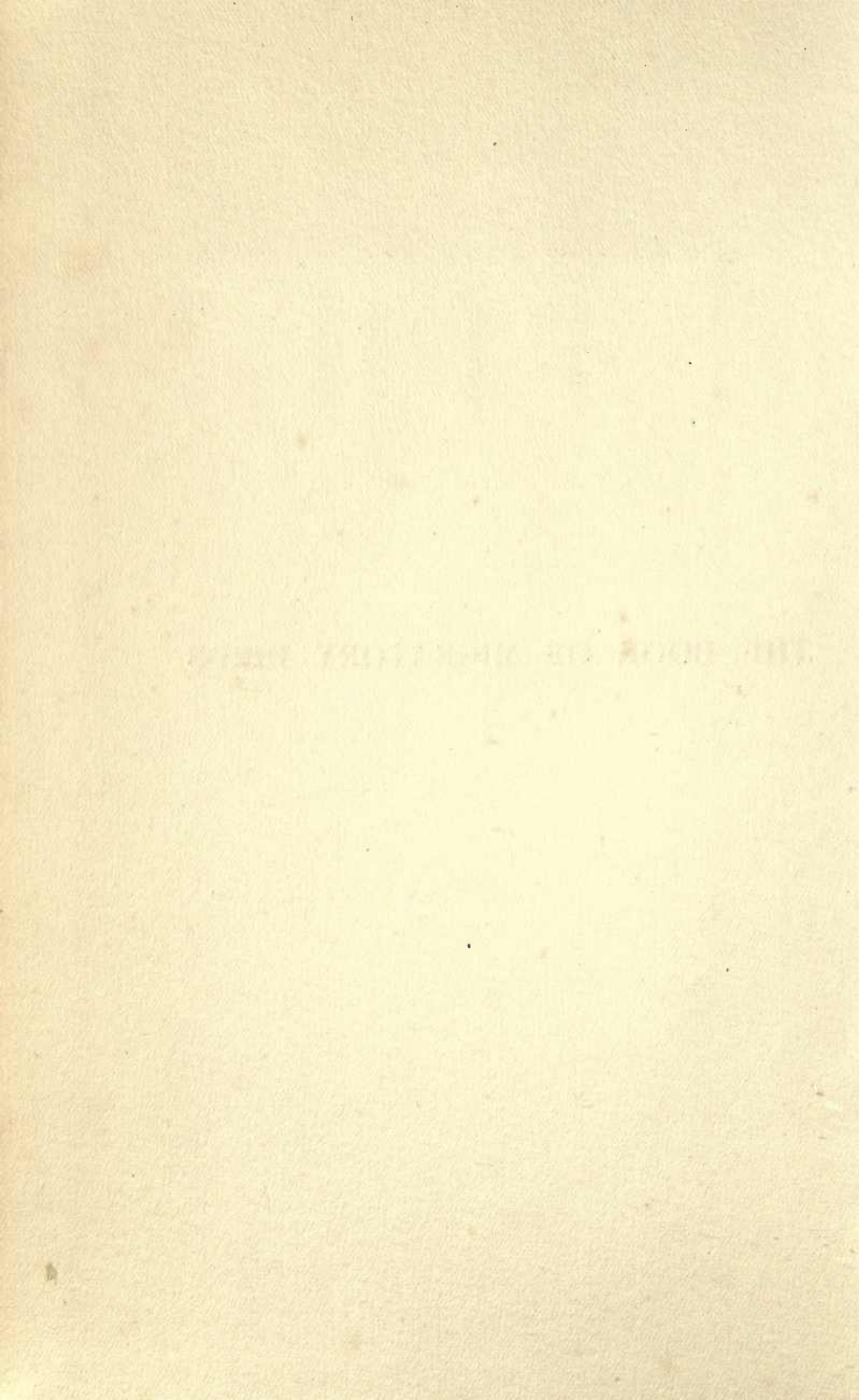


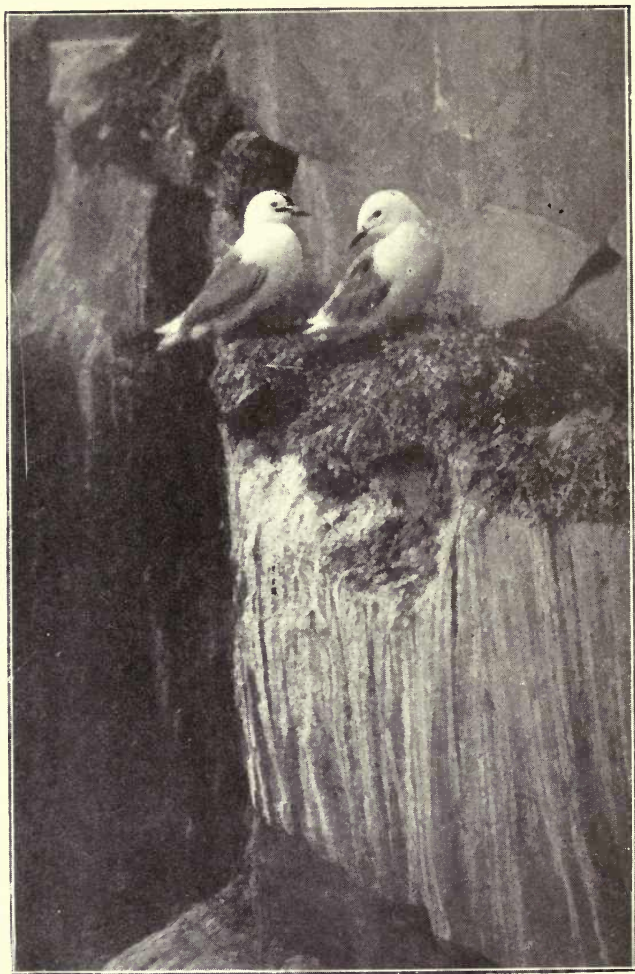


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THE BOOK OF MIGRATORY BIRDS





KITTIWAKES NESTING.

THE BOOK OF MIGRATORY BIRDS

Met with on Holy Island and the Northumbrian Coast, to which is added descriptive accounts of Wild Fowling on the Mud Flats, with Notes on the General Natural History of this district.

BY

W. HALLIDAY,

Illustrated by Photographs.



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1909?

Birds

Preface.

IT has been suggested by naturalists and wild fowlers who have from time to time visited this part of England, that I should write a book of my experiences respecting observations of the migratory feathered tribe.

Of the bigger birds, which habitually visit the place from early September to the end of March, I have observed more than thirty distinct species, hence the many visits paid by wild fowlers during the winter. Some rare specimens are met with, and it seems somewhat incredible that over one hundred varieties of the winged tribe have been noted on this island, great and small. This remark applies equally well to the whole stretch of the Northumbrian coast—with few exceptions—from the Tyne to the Tweed and Firth of Forth.

For valuable aid in the compilation of this book I am greatly indebted to the following gentlemen:—

- (1) Sir Ralph Payne-Gallwey, Bart., President of the Wild Fowlers' Association.
 - (2) Stanley Duncan, Esq., Hon. Secretary of the above Association.
 - (3) Arthur Bonsall, Esq., Editor "Shooting Times."
 - (4) R. Fortune, Esq., Fell. Zool. Soc., Harrogate,
- all of whom have proffered descriptive notes and lent illustrations.

I am also indebted to A. H. Robinson, Esq., for his excellent photos of the "Sunset on the Sands," &c.; and to Mr. English, of Seahouses, for his charming Farne bird pictures.

To Sidney H. Smith, Esq., of Heworth, York, I am vastly indebted for his interesting bird-nesting, cliff-climbing, and wild fowling scenes.

I also acknowledge the interesting notes of Mr. Meech as to the marking of birds on the Northumberland estate; and the North Eastern Railway Company have placed both pictures and matter at my disposal, for which I tender grateful thanks.

Harwood Brierley, Esq., has also permitted me to use descriptive matter referring to certain birds.

To each and all I return my hearty thanks.

W. H.

Introduction.

I AM about to describe the particular species of Natatores, or Swimmers, mostly seen here on Holy Island and the Farnes, and whose whole life and business is among the waters.

From the insular character of this place these are conspicuously numerous in a fauna so limited; and while thousands in summer—speaking of the British Isles as a whole—seek our precipitous coasts and headlands as breeding stations, others, scarcely less numerous, flock in winter from their more northern incubations, and fill our bays and marine inlets.

The contrast of these localities at the different seasons is most striking; rocks standing far in the ocean's void, and precipices of the most dizzy height, to which all approach by land is cut off, possess a dreary solitude for seven or eight months of the year; a few cormorants seeking repose during the night, or some gulls claiming a temporary shelter or resting-place from the violence of the storm, are almost the only, and then but occasional, tenants.

In the throng of the breeding season a very different picture is presented: the whole rocks and sea and air are one scene of animation, and the various groups have returned to take up their old stations, and are now employed in all the accessories of incubation, affording lessons to the ornithological student which he will in vain look for elsewhere; the very rocks are lighted up, and would seem to take a brightness from the hurry around, while the cries of the inhabitants, discordant alone, harmonise with the scene.

During the same season, upon the low sandy or muddy coasts, or extensive merses, where the tide recedes for miles, as on Holy Island, and the only interruption on the outline is the slight undulation of some mussel-scaups, the dark colour of some bed of "*Zostera Marina*" contrasting against the long bright crest of the surf, or in the middle distance some bare posts set up as a land-mark, or the timbers of some ill-fated vessels rising above the quicksand, there reigns, on the contrary, a solitude of another kind; it is now broken only by the distant roll of the surf, by the shrill pipe of the ring-dotterel, or the glance of its flight as it rises noiselessly; a solitary gull or tern that has lagged from the flock may sail along, uttering as it were an unwilling inward sound as it passes the intruder; everything is calm and still, the sensation increased by the hot glimmer that spreads along the sands; there is no voice, there is no animal life.

During winter the scene may at first sight appear nearly similar; the warm and flickering haze is changed for a light that can be seen into; the noise of the surge comes deeper through the clear air of frost, and with it at intervals hoarse sounds and shrill whistles, to which the ear is unaccustomed; acres of dark masses are seen, which may be taken for low rocks or scaups, and the line of the sea in the bays contains something which rises and falls, and seems as if it were about to be cast on shore with every coming swell.

To sportsmen these signs are familiar, and they know their meaning; but to one who has for the first time trodden these flat coasts some distant shot or other alarm first explains everything. The line of the coast is now one dark moving mass; the air seems alive with water-fowl, and is filled with sounds that rise and fall, and vary as the troops wheel around, and this continues until they have again settled to their rest; as dusk approaches, these sounds are gradually resumed, at first coming from the ground, as warnings that it is time to be alert; as the darkness and

stillness of night sets in, one large flock after another hastens to its feeding ground, and the various calls and the noise of wings is heard with a clearness which is sufficient to enable the sportsman to mark the kinds, and trace his prey to their feeding-stations, to make him aware of their approach long before they come within his reach.

The total number of British birds enumerated by Jenyns, exclusive of twenty-six doubtful species, is three hundred and twelve, of which *Natatores* furnish ninety. Of the latter again, one half nearly is made up of ducks, there being, according to the above-mentioned authority, forty-one species, including the Mergi or Gooseanders.

The remainder is chiefly composed of gulls, including the terns and petrels; while the grebes, divers, cormorants, and solan goose make up the balance.

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[By kind permission of Rob. Spence, Esq., A.R.A.]
ST. CUTHBERT, ON HOLY ISLAND, BEING OFFERED THE BISHOPRIC OF HEXHAM.

Holy Island (Lindisfarne).

Its Position Geographically.

THE original name was Lindisfarne, which means a recess or retreat by the brook "Lindis," and this stream emanates from the mainland near to Goswick, and after taking a circular or semi-circular course seaward, it returns to the mainland. The traveller crosses this oft-times formidable stream soon after leaving the Beal side for the Island.

The more modern name was doubtless given to it in memory of the former sanctity of the place, and also because of the blood of the monks who were cruelly massacred by the Vikings in the ninth century. There is evidence that the new name was given to it on the re-establishment of the Priory.

The Island is triangular in shape, with its base seaward, and its apex opposite the mainland. It is seven miles, as the crow flies, south of Berwick-on-Tweed, 360 miles from London, and about equi-distant from Edinburgh on the north, and Newcastle-on-Tyne on the south (sixty miles approximately).

Holy Island, luckily, is not a fashionable watering-place. It is off the beaten track, and visitors can go where they please and do what they please, and those who come once invariably repeat their visit.

A trap can be summoned by telegram from either of the following: Mr. Rob. Bell, Post Office, Holy Island; Mr. James Brigham, Holy Island; Mr. Geo. Wilson, Northumberland Arms, Holy Island; Mr. Morton, The Plough

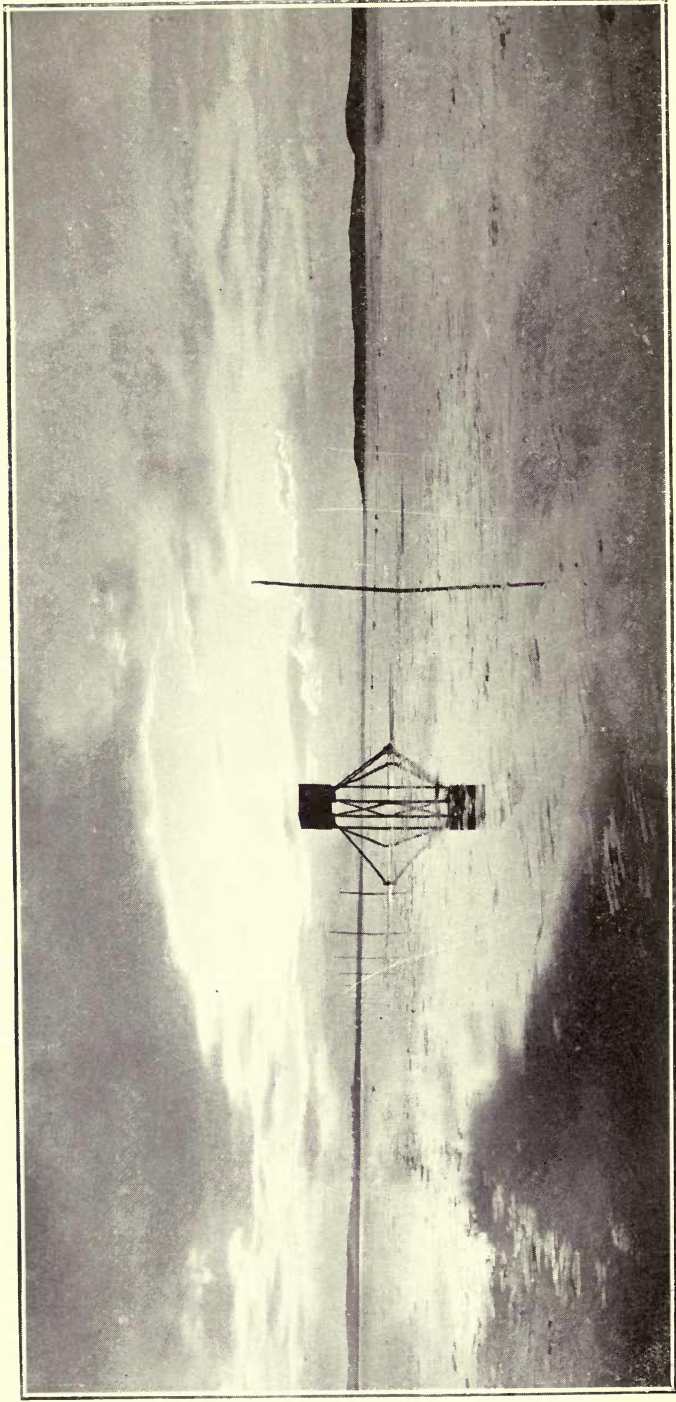
Hotel, Beal, R.S.O. The usual charge is 4s., but the post-cart, which leaves Beal Station at 8.30 a.m. and 2.15 p.m., will bring a person for one shilling.

The accommodation is reasonable and good in the hotels and private houses. The hotels are:—Iron Rails, Mr. Geo. Brigham; Northumberland Arms, Mr. Geo. Wilson; Crown and Anchor, Mr. Halloran; Castle, Mr. Thos. Kyle.

The usual charge is from 5s. to 7s. 6d. per diem, and in private houses 4s. to 5s. 6d.

For boating, fishing, &c., one is perfectly safe in the hands of the fishermen, and extortion is not in their vocabulary. A boat can be hired for pleasure for the small fee of 6s. per week in the summer, whilst one or two good shooting punts are available for the fowler; one contains an up-to-date breech loader, the hire of which is 10s. per diem, the hirer taking all spoils.

There are also several seaworthy cobs suitable for the journey to the Farne Islands. For such a trip the usual charge is one pound for the party of four or more. Messrs. G. and T. Kyle, and others, let these cobs and sailing boats.



[Photo—A. H. Robinson, Scalby,

SUNSET ON HOLY ISLAND SANDS,

Holy Island and its Bird Life.

THE naturalist and bird lover looks upon this wind-swept and comparatively desolate island as the true rendezvous, in winter, of the feathered tribe, and he is quite correct in this respect, whilst the historian from very early times associates the place with the countless flocks of migrants, which visit the island in the season, and he, too, is perfectly in order in so doing, for we are told on excellent authority that when the Vikings swarmed on the coast in the ninth century, and completely desolated the island by cruel massacre, "the place was left to the birds in undisturbed possession" for upwards of two centuries; and it might further be said, in perfectly good faith, that the number and variety of the species have not, in any sense, diminished through the ages.

During the migration period—say from early September to the beginning of March—many rare specimens of the bird tribe are seen, and oft-times captured on these shores, thus—

The Little Auk, whose breeding-place is circum-polar—for a celebrated Arctic traveller, Captain Fielden, found it nesting in latitude 82°, north—was brought to the writer on January 23, 1909, and on two previous occasions this handsomely plumaged bird was captured here this season.

A very rare visitant is *the Rough-legged Buzzard*, and it is now some five years since last seen on the coast.

The Golden Eyes (Garrot) came into view in December, 1908, and there are evidences of its visit, year by year, in the stuffed specimens exhibited in several of the cottages of the fishermen.

Another rare bird is *the Shoveller*, one of which species was shot this winter. Indeed, amongst the natives of the island it is affirmed that this bird bred here a few years ago. One man states that he received the sum of ten shillings for a single nest of eggs, whilst individuals inform me that they used often to find the eggs near the keeper's cottage at the Snook end. It comes now but rarely.

Of *the Pintail*, or what the fishermen call the long-tailed duck—the male of which has most gorgeous plumage—two have been taken since Christmas last.

Lord William Percy, of Alnwick Castle, shot the last from a coble outside the bar. It is curious to note the vernacular term applied to these ducks, for instance the male is called by the natives "Jacky Foster" and the female "Jennie."

Richardson's Skua is a winter visitant, and is easily distinguished from the others of the species by its swifter flight and darker plumage. Its eggs are somewhat similar to the true gulls. Very rarely does it take the trouble to seek food for itself, but lives almost exclusively on the depredations of the gulls and terns. This species of gull usually derive their entire food from the pursuit of other birds, using what they are made to disgorge. I spent a most agreeable half-hour in mid-winter watching the manœuvres of this bird in its method of prey-seeking. Its rapid, darting flight was most noticeable, and its general method of attack proved most interesting. It is not of the diving species, as has been affirmed by some writers.

The Scaup (pochard) may be seen at any time during the winter months, in various places on the coast, and the red-headed scaup is also seen here, but rarely. These birds are known locally by the term "covey."

The Snow-Bunting may be singled out as an exceedingly shy visitor, save in hard winters, though it occurs all along the Yorkshire coast. Several were discovered here during the snowy weather in early February, 1909.

Not less rare is the *Great Grey Shrike*, whilst the *Spoonbill* ranks nearly as rare. The latter is known here by the name "Willick," and good specimens were captured this year in January.

The *Arctic and Sandwich Terns* may be seen all the summer, for they make both this island and the Farnes their breeding ground. The *Roseate Tern* is represented by just a couple of pairs on the Knoxes, Farne Islands, during the period of incubation.

The *Razor-Bill*, known locally also by the name of "Willick" among the natives (who probably confound this bird with the spoonbill when seen on the wing), has been seen and captured quite recently.

The *Puffin*, or sea-parrot, called also "Tommy Noddy"—which is probably a corruption of the Scotch, "Tammy Norrie"—is very common, and may be descried in company with the *Guillemots*, both of which breed on the friendly Farnes.

Neither of these make nests. The former usually selects a rabbit burrow, and lays the eggs on the bare ground, some ten or twelve inches from the surface, and woe to the inquisitive person who essays to thrust his hand into the hole, for a decisive peck will instantly be meted out as a punishment.

Of the *Scoter* family of ducks, both the common and velvet—the latter a fine bird—are found here, and preserved specimens can be seen. The surf-Scoter is never met with. The latter is regarded as an American duck.

The *Merganser* has often been seen and captured in the harbour and on the Ross-link side of the island.

There is a bird which attracts many to this place, viz., the *Great Northern Diver*, an excellent specimen having been shot this year in January by Lord William Percy beyond the bar, or "right out," as the fishermen say.

Cormorants, *Eider-ducks*, and *Shell-ducks* may be seen at any time, the former breeding in large numbers on the Farne Islands.

It should be noted in passing that it is a common

practice in China to tame and use this bird for taking fish. A ring is fastened round the lower part of its neck, to prevent it swallowing the fish it catches, and thus its owner increases his revenue by its exertions. At one time an ingenious islander adopted the same plan, and was equally successful. The two latter species (Eider and Shell-duck) make their nesting haunts on Holy Island, and whilst the former also breeds on the Farnes the latter prefers the mainland opposite these islands for incubation. Very rarely do either succeed in hatching their eggs on Holy Island, because of the rascally gulls, who are ever on the alert to steal the eggs, should the mother birds leave the nests uncovered for any time.

Oyster-catchers or *Sea-pies* are numerous, and so are *Godwits* or *Speeths*.

The great attraction which this island holds out to sportsmen is centred in the dense numbers of *Wigeon*, *Mallard*, *Curlew*, *Teal*, *Plover* (green, grey, and golden), *Pink-footed* and *Brent Geese*. It is no exaggeration to say that they arrive in clouds, and can be observed thousands strong in the air, and also on the mud-flats, feeding on the wigeon grass, or "*Zostera Marina*." These sportsmen have usually a lively time of it, bringing to shore from twenty to eighty per day. The writer inspected the victims of two shots by the swivel punt gun in December, 1908, when he counted eighty birds, chiefly wigeon and mallard, with a sprinkling of teal.

During one week in the previous month (November) the sum total brought in by punts and shore gunners reached two hundred and thirty-five birds.

The brent this year have been exceedingly wary, and only some thirty of this kind have been brought down, though they have been as numerous as ever.

This island has been called the "birds' sanctuary," and judging by the numbers on the stakes at ebb and half-flood tides, it is patent that the place is a great attraction for the winged tribe, though whether—judging by the slaughter—

it is really in the true sense a sanctuary or hallowed spot, I will leave my readers to form an opinion.

It should be mentioned that the *Water Rail* was shot here a season or two ago, and can be seen preserved, and the pretty *purple Sand-piper* or "Tinker" is often met with.

Every kind of bird may be seen at times on the shore, from the diminutive *Golden-crested Wren*—which usually arrive in large numbers in mid-November—to the huge *Heron* and the gigantic *Crane*, a monster standing six feet, but of the latter it should in all truth be stated that this bird has made only one appearance, in November last, within the memory of the oldest inhabitant. From some correspondence in the "Field," it appears this bird escaped from a private collection at Morpeth.

For several years it has been noted that visits are paid by the *Hoopers*, or Wild Swans, in parties of four, six, or even eight, and these visits have been annual, mostly during severe weather.

On Monday, March 2nd, 1909, a string of fourteen were seen to pass over the "Law" in close proximity to the harbour on the Ross-link side. They were evidently making for Budle Bay, which is in a south-easterly direction. Though common on the Scottish shores, they are undoubtedly considered a great prize to a sportsman.

Three members of the *Wheat Ear* family of birds arrived on April 9th, and from careful observation it has been shown for several years that the bird invariably arrives whilst the Cheviots—opposite the island—are clothed in a mantle of snow. The names applied to this bird are various, for instance, Fallowsmith, White-tail, or White-rump.

This clean, interesting bird is one of the earliest of our summer visitants. It breeds in holes, under and among rocks and stones, in the burrows of rabbits, even occasionally in those scraped by the Sand-Martin, in old walls,

and in quarries, and its nest has been found in the rents or splits of dry peat mosses.

It is time for its usual follower, the *Sand-Martin*, to put in an appearance, for it is noted by the native naturalists that this bird usually arrives before the fourteenth of the month (April).

II.

Whilst the Farne Islands justly receive the title of "sanctuary" for the feathered tribe—for here birds breed in countless numbers—Holy Island, its neighbour, is a famous haunt of wild birds all the year round.

During the spring and summer many rare small migrants are seen and noted both by the natives and visiting naturalists. But the greatest interest is taken in the countless numbers of birds which arrive in September and October, on what is termed the Autumn Migration. They invariably arrive in small colonies at first, and experienced naturalists tell us that the "advanced guards," a term which we may rightly apply to these forerunners, are mainly—if not wholly—composed of young birds. This is, however, a matter of contention with some, as is also the theory that birds leave their northern homes with a favourable wind. The following is as complete a list as it is possible to obtain, and many bird-lovers come from London and other distant cities and towns to see the birds here given :—

Blue Tit.
Wren.
Golden-crested Wren.
Black-cap.
Sea-mouse.
Chaffinch.
Blue Throat.
Apple-sheely.
Bull-finch.
Snow-bunting.
Cock-o'-the-North.
Pied Fly-catcher.

Little Gull.
Lesser Black-back Gull.
Herring-Gull.
Black-headed Gull.
Razorbill.
Black Guillemot.
Little Auk.
Puffin.
Cormorant.
Great Northern Diver.
Little Grebe.
Shell-duck.

Robin.
 Hedge-Sparrow.
 House-Sparrow.
 Lark.
 Green-linnet.
 Grey-linnet.
 Ring Ouzel.
 Swallow.
 Redstart.
 Lesser Whitethroat.
 Whitethroat.
 Brent-linnet.
 Long-tailed Tit.
 Water-Wagtail.
 Stone-chat.
 Gold-finch.
 Barn-owl.
 Little Owl.
 Redshank.
 Great Snipe.
 Jack Snipe.
 Woodcock.
 Little Stint.
 Knot.
 Purple Sandpiper.
 Green Sandpiper.
 Curlew.
 Spotted Redshank.
 Green Shank.
 Common Tern.
 Arctic Tern.
 Roseate Tern.
 Sandwich Tern.

Mallard.
 Teal.
 Wigeon.
 Pintail.
 Brent Goose.
 Solan Goose.
 Pink-footed Goose.
 Egyptian Goose.
 Common Heron.
 Night Heron.
 Spoonbill.
 Water-rail.
 Moor-hen.
 Green Plover.
 Golden Plover.
 Ringed Plover.
 Ringed Dottrell.
 Grey Plover.
 Eider.
 Corn-crake.
 Partridge.
 Pheasant.
 Oyster-catcher.
 Blackbird.
 Crow.
 Rock-dove.
 Falcon Hawk.
 Jackdaw.
 Martin.
 Sparrow Hawk.
 Dunlin.
 Woodpecker.
 Sand-Martin, etc.

Mr. Allen W. Seaby, University College, Reading, gives the following account of the birds he saw at Holy Island :—

During my recent short stay on Holy Island, Northumberland, to study bird life, my observation of the birds was limited to what could be seen from the land, as I did not go afloat. I arrived at the island a few days after the great snow-storm of Christmas, 1908, the first day, as it happened, when the Northumberland roads were clear, though the snow at the sides was piled level with the hedgetops.

As we crossed the sands my driver pointed out bunches of wigeon in the distance. After leaving my bags at an

hotel I strolled beyond the Castle, and at once saw one of the objects of my journey, for half a dozen eider-ducks were observed a short distance out washing and diving, the white and black of the old males contrasting strongly with the sooty brown of the females.

Once an eider-duck brought up something like a crab, which she began to shake vigorously. A herring-gull, hovering about, immediately swooped down, and tried to wrest the morsel from the duck, which dived, and the disappointed gull moved off.

My chief interest lay in the brent geese, and I was pleasantly surprised during my first walk to meet two lads, one of whom carried a winged bird of this species. It seemed little injured, but gagged mournfully.

I was surprised at the small delicate head and tapering neck, so different from the clumsy grey goose. The bird was much smaller and more lightly built than I had anticipated, not bigger than a shell drake.

I enjoyed many opportunities of seeing the brent, as they always come to feed on the stakes, in daytime if possible, returning to their sea-quarters.

It was exciting to go out in early morning at half-flood tide, and to observe the lines of geese, becoming more distinct, till their gagging became audible. As they passed boats or rocks, where gunners might be hidden, they rose high in air, out of shot, even on windy days, though on two occasions I saw individuals fall to well-directed shots.

But no amount of shooting will keep these members of the feathered tribe out of the mud-flats, for food they must have, and in winter it is almost exclusively the sea grass, or "*Zostera Marina*," the colour of which gives large portions of the stakes their green appearance.

These birds spend the night at sea, tossing on the waves, where they are safe from punts, armed with swivel guns. One morning as I scanned the sea from the vantage ground of the Castle rock, I saw through my glass a series of black dots, out some distance. I found these dots



CROSSING THE SANDS AT LOW WATER, HOLY ISLAND.

extended in long lines, gradually advancing towards the land, and I realised that I was watching the army of brent geese edging in towards the harbour.

On several occasions I saw the Scaup duck, or Covey, close to the reefs between the Castle and the false Emmanuel Head. There were about a dozen—old males, with black heads and necks, and pretty fretted backs; females, with the white band around the bill; and the young, in immature plumage. They all seemed expert divers, and I noticed on two occasions they disappeared, one after another, till none were visible, as if they had special pleasure in raiding the shell fish in company.

I did not see the "golden eyes," which I found were locally called wigeon by the fishermen, nor the Scoters, which I think is the velvet duck spoken of by the natives.

I saw a long-tailed duck on one occasion, in company with some eiders. I had just time to recognise his head and short bill, and the long black tail, when he dived, and I saw him no more.

Mergansers I saw in the harbour, and divers, though as the time was mid-winter they were not in full dress.

I likewise noticed the quiet yet prompt disappearance of the divers when diving, the body just sinking out of sight, a very different motion from the energetic head-over-heels action of the ordinary diving ducks and cormorants. Of these latter I saw many. Doubtless they would be found in spring at the Farnes. I noticed that the buoy beyond the "Plough Seat" was always tenanted by one or more cormorants, either resting or on the alert for fish.

In flight the divers looked much longer and more pointed than the cormorants, and of course they showed whitish below, whilst their wings were small.

I experienced some little trouble in identifying birds, owing to the use of local names. A dead Razor-bill which I saw in the post-office was spoken of as a "willick," but probably this bird was confused with the guillemot.

I was informed that several little auks had been shot,

but not whilst I was on the island. A friend sent me one later. I saw the usual family of shore birds, small flocks of ring-plovers, dunlin, and oyster-catchers. To my great disappointment, I saw no turnstones, nor purple sandpipers. Redshanks were common, and made the same jerking motions that I had seen them make in the breeding season.

What most impressed me was the enormous number of wigeon, like the geese, out at sea at high tide.

On one occasion I turned my glass on a seeming black reef, and discovered it to be a dense mass of these birds, resting. They simply "blackened the sea," as remarked by a fisherman, and when they rose it was as a dark cloud. Compared with such multitudes, the half-dozen or so shot each night hardly amounted to the proverbial "drop in the bucket."

Of land birds I saw few, as might have been expected on such a shelterless, wind-swept island. A few thrushes hopped with a disconsolate alien air, and among them was a fieldfare, whose fellows had doubtless distributed themselves over the mainland.

The meadow pipits were there, and remarkably tame, probably having been starved down through the stress of weather. On the ruins of the famous Lindisfarne Priory were perched appropriately a party of jackdaws, and on the Castle wall was always a starling, which whistled shrilly in the wind.

A dead Godwit brought in by a gunner was the only specimen I saw, though a good writer, Mr. Abel Chapman, mentions it is common as a winter bird, in this place.

I close this rough sketch, well knowing that the shortness of my sojourn prevented me from seeing many interesting specimens of bird life on this true haunt of the birds.



SIR RALPH PAYNE-GALLWEY, BART.
(PRESIDENT OF THE WILDFOWLERS' ASSOCIATION).

Wild Fowl Shooting at Holy Island.

Sir Ralph Payne-Gallwey gives
the following interesting account.

I SHOT over the tidal flats for ten years, usually for six weeks after Christmas, with the assistance of one of the best puntsmen in England, with every appliance for obtaining sport, and at all hours by day and by night.

The Brent geese are seldom present in any number before Christmas, but after Christmas, and till the end of February, they are often very numerous. In a hard winter, especially if the weather is severe in North Holland and in Denmark, from 1,500 to 2,000 geese frequent the mud-flats. In mild winters their numbers vary from 600 to 800.

These birds are very difficult to obtain for the reason that they pass most of the day in security at sea, and only fly to the flats to feed on the sea grass (*Zostera Marina*) when the tide is low. They are then, as a rule, unapproachable, as they are careful to alight at a long distance from the water, and when a boat or punt can push up within a couple of hundred yards of them, on the flowing tide, they fly out to sea or to other parts of the flats where they are secure from the gunner.

At the same time, by the exercise of much patience, hard work night and day, and a good deal of luck, a shot at the Brent with a punt gun can now and then be achieved, especially in very windy weather, when they fly low and are not so apt to leave for a rough sea. But this only occurs when the wind is strong and, of course, on shore.

In such favourable weather, and with plenty of frost, a bag of from 60 to 80 geese may be made during the month of January. I have obtained as many as 200 after Christmas, but with every exertion, as well as with good luck, the average number would seldom exceed eighty of these excessively wary fowl, and in mild winters perhaps not more than from 40 to 50.

What causes all gunning afloat from Holy Island to be difficult is the fact that the entire estuary dries at low water, and that there are then no creeks and channels along which a boat or duck punt can be paddled up to the birds as they rest or feed on the flats. If this was not the case the geese would not remain, as they would soon be driven away to other haunts. By anchoring a boat behind small promontories or under the shelter of rocks, occasional shots at the geese may be had with a shoulder gun as they fly from the sea to or from the mudflats, presuming always that the wind is strong enough to cause the birds to fly low.

As to other wild fowl, there are very few. I have never seen a hundred wigeon together, and probably at most a couple of hundred frequent the flats, and then seldom during the daytime.

In hard frost, wild duck are driven from inland ponds and rivers to the tide, and sometimes a score may be noticed, but usually not more than a half dozen here and there, and these are probably sleeping in safety on the dry ooze far beyond the reach of the fowler's gun. Teal are rare visitants; in ten years I scarce saw a dozen. Among diving ducks, the scaup is the common species at Holy Island, few others of this worthless tribe being seen.

Many shore birds may be noticed, though few of interest from the gunner's point of view. Plovers, golden and green, are scarce, though they are common on the marshes and fields near the sea shore. In severe weather there are always three or four swans about, both Hooper's and Bewick's.

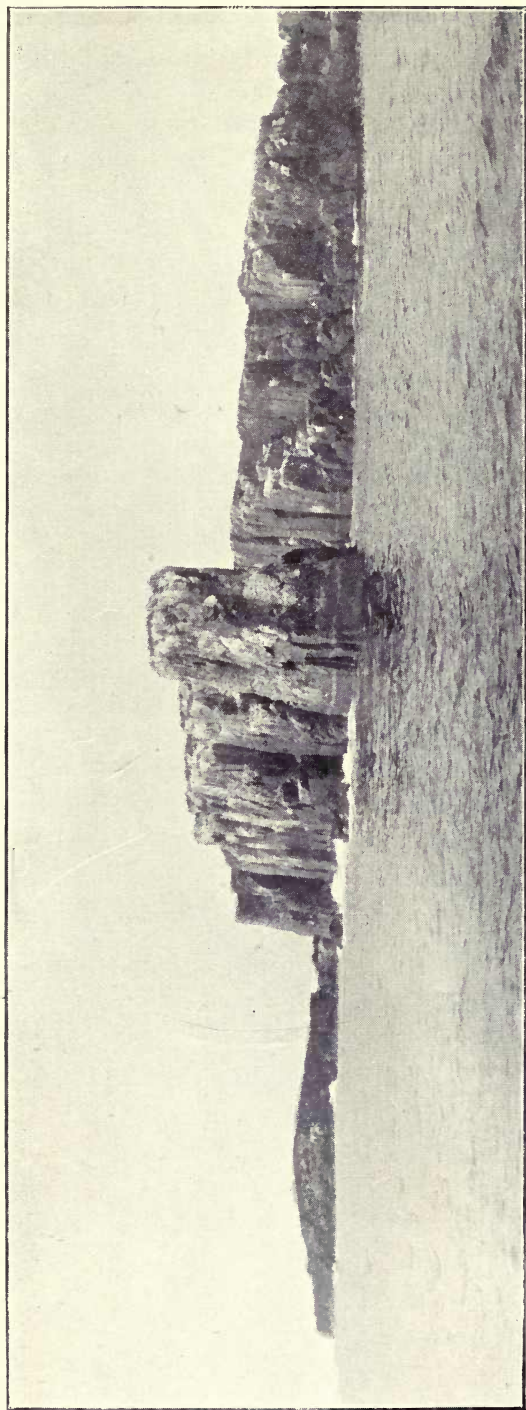
To an enthusiastic wild fowl shooter I can imagine a fortnight at Holy Island in hard weather would be a delightful excursion, for even if his bag were a light one, he would always have the chance of a few shots, and, at all events, have the pleasure of seeing wild fowl, that is, Brent geese, in considerable numbers.

Bird Life on the Farne Islands.

THE Farnes consist of a number of low basaltic islets, some fifteen in number, and cover an area of from three to three and a half miles. Some are isolated rocks, others are partly covered with a coarse herbage of various kinds, amongst which thrift and white campion are conspicuous.

The Inner Farne is the nearest island, being situate two miles from the mainland. Near it are the east and west Wide Opens and the Knoxes; after crossing a channel a mile and a half wide we reach the Staples, with the Pinnacles, the North and South Wamses, Big Harcar, Clove Car, and Brownsman. The Crumstone, the breeding place of several seals, is a mile and a half south-east from the Staples, and to the north-west is situate the Megstone, the rock on which the cormorants breed. The Outer Farne or Longstone is the most northerly of the islands, and five miles from shore.

A lighthouse is placed on the Longstone, and in the early hours of September 6, 1838, the steamer "Forfarshire," of three hundred tons, bound from Hull to Dundee, drifted on to the Harcar rocks, which are close to the Longstone, and broke up. Many of the passengers and crew were drowned during the terrible storm that raged on that wild September night and morn. Grace Darling, the lightkeeper's daughter (only 23 years of age), induced her father to launch a coble, and after a gallant struggle succeeded in reaching the wreck and bringing off what remained of the passengers and crew. The heroine, Grace Darling, died in 1842, when 27 years of age. She is



PINNACLE ROCKS, FARNE ISLANDS,

[Photo—A. H. Robinson, Scalby.

buried in the churchyard of Bamburgh, the village in which she was born.

The Inner Farne is the largest of the islands, and to this romantic situation St. Cuthbert retired and lived as a hermit, "far from the madding crowd," for nine years. The two lighthouses and the tower, a square-shaped structure erected by a Prior of Durham, are the only other buildings. The Farnes are leased to an association that is interested in the protection and preservation of the species breeding there:—

The Rock Dove (Columba livia).—This species can be distinguished from its near relative, the stock dove, by the white rump (instead of blue) and by having black bars on the wing. It nests in a cave below the Pinnacles.

The Ring Plover (Ægialitis hiaticula).—The eggs, four in number, are laid upon the shingle, and are marvellous illustrations of protective coloration; so closely do they resemble their surroundings that it is extremely difficult even for the trained eye of an ornithologist to distinguish them. The young birds, too, when just hatched, harmonise perfectly with the colour of the sand or shingle upon which they rest. This protection is increased by their remaining perfectly motionless when danger is near.

The Oyster-catcher (Hæmatopus ostralegus) nests on the shingle on the Wide Opens, and usually lays three eggs, which, like those of the ring plover, closely resemble their surroundings, as also do the young birds. The oyster-catcher, also called sea-pie or olive, has an orange-coloured bill, legs of a flesh colour, and black and white plumage, making it a most conspicuous and handsome bird.

The Herring Gull (Larus argentatus) nests on the Staples and the Wamses. The eggs of this species are very difficult—practically impossible—to distinguish from those of the lesser black-backed gull, a very much commoner species on the Farnes. Eggs, two or three in number.

The Sheldrake (Tadorna vulpanser).—A species of duck that frequents sandhills and nests in a burrow. It is sometimes called burrow duck.

Rock Pipit (Anthus obscurus).—A close relative of the meadow pipit. This bird makes its nest in the crevices of the rock and lays four or five eggs.

The Cormorants (Phalacrocorax carbo) nest on the Megstone. On approaching the rock the old birds may be seen standing on the rock like sentinels, but fly off before you land. The situation chosen for nests is the highest part of the island. The nests are large structures, composed of coarse sea-weed, usually about 18 inches in height. The cormorant is a large bird, about three feet in length. Its eyes are of a bright emerald green colour, and its plumage almost entirely black. Cormorants are trained by the Chinese to fish, and also by some gentlemen on the south coast of England. Albinos occasionally occur. The black-backed gulls levy a heavy toll on the eggs of this species.

The Lesser Black-backed Gull (Larus fuscus) nests on the Wamses, the Staples, and the Wide Opens. Eggs, two or three in number. These birds destroy great numbers of the eggs of most of the species breeding on the Farnes.

The Kittiwake (Rissa tridactyla).—The nesting place of this species is on the sides of the Pinnacles, where their nests are to be found on every accessible ledge. The eggs are obtained by means of a small net fixed at the end of a long pole. The kittiwake may be distinguished from any European gull by the absence of a hind toe. Plumage of the mature birds: Head, neck, tail, and under parts white, mantle grey, wings (flight feathers) with a good deal of black, legs and feet black. The kittiwake has a peculiar cry which resembles very closely its name.

The Roseate Tern (Sterna dougallii).—First discovered as a British bird by Dr. M. Dougall, of Glasgow, who found it in the Firth of Clyde. Harting says (page 292 of "Handbook of British Birds"): "Unlike the common and Arctic terns, the bill of this species, when adult, is black, with the gape orange, and the legs and feet orange red." One or two pairs of this beautiful and rare tern

breed on the Farnes (the only locality in Britain where it now nests).

Sandwich Tern (*Sterna cantiaca*).—First discovered as a British species at Sandwich, in Kent, a summer migrant. Harting says (page 293, "Handbook of British Birds"): "At once distinguishable amongst other terns on the same breeding ground by its superior size, fuller wings, the expanse of which is 2ft. 9in., black bill with yellow tip, and black legs and feet." Nests on the Wide Opens. This bird has a peculiar harsh, grating cry, which can be heard at a considerable distance. A large colony nests on the Knoxes. The eggs of this species are two or three in number, and are subject to considerable variation. The numbers of this species nesting on the Farnes show a considerable increase.

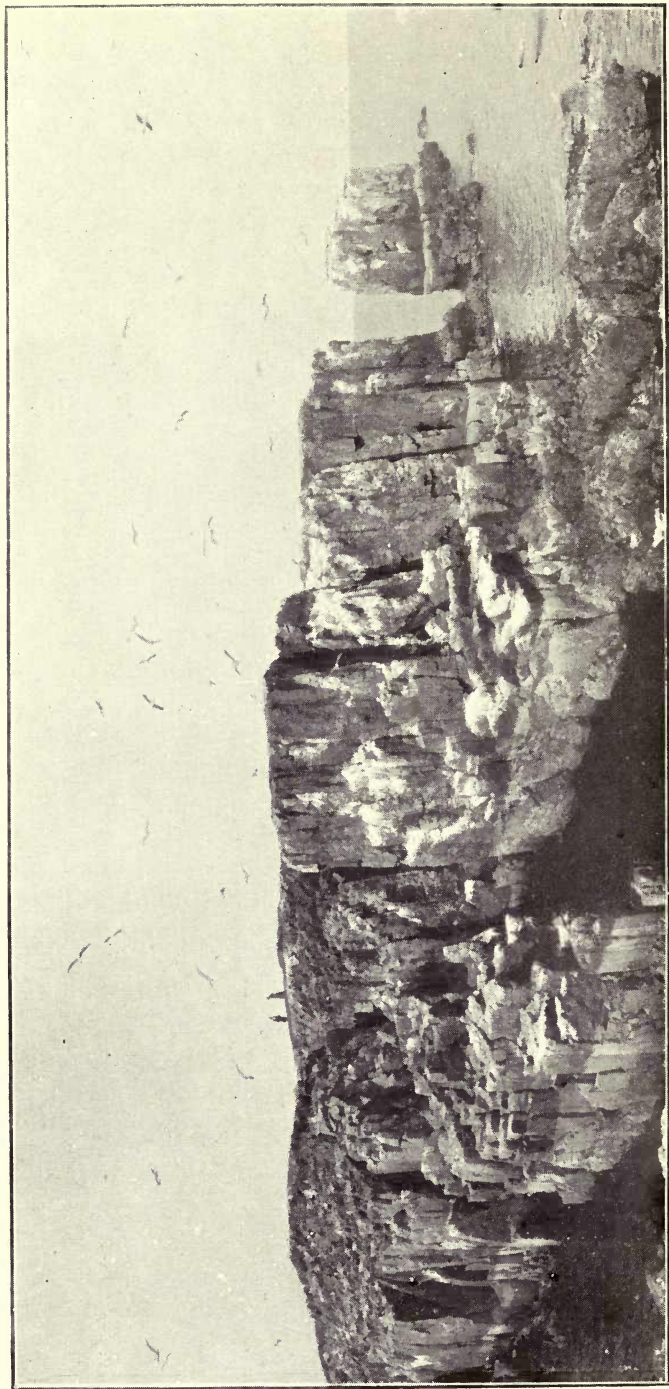
The Arctic Tern (*Sterna hirundo*).—Breeds in company with the common tern on the Longstone, one of the Farne Islands. According to Mr. J. E. Harting's valuable "Handbook of British Birds," page 290, "when near enough to be clearly distinguished, it may be known from the common tern by its shorter bill, which is wholly red, *i.e.*, without a black tip, and by its longer outer tail feathers, as indicated by the specific name *macrura*." On closer examination it will be found to have shorter legs than the common species. The young of both kinds have the dorsal plumage mottled and barred with buff; the bill yellow, with a dark tip, the legs and feet at first yellow, then orange brown, finally red. Nests on the Brownsman and the Wide Opens. The eggs are in such numbers that great care has to be exercised to avoid treading on them. It is practically impossible to distinguish the eggs of this species from its relative, the common tern, except by seeing the birds.

The Eider Duck (*Somateria mollissima*).—Mr. Fortune said the numbers of this species nesting on the Farnes had wonderfully increased during the last few years, which increase was undoubtedly due to the protection it received during the breeding season, and estimated the number

nesting on the Farnes in 1908 as nearly three hundred pairs. When sitting, the female bird will often allow a very near approach, and can sometimes be stroked upon the nest. The down of this species is grey in colour, and highly valued for quilts and coverlets, about $1\frac{1}{2}$ lb. being required to make a coverlet for one bed. Unbleached down usually fetches from 12s. to 15s. per lb. The eider breeds most commonly on the Brownsman, and also nests on the Wide Opens. The drakes during the breeding season spend all their time out at sea, and do not assist in incubation. The nests are principally composed of seaweed, and are lined with down plucked from the bird's breast. The eggs are four in number, of an olive green colour. The female bird on leaving the nest covers the eggs with down. This covering not only keeps the eggs warm but protects them from the prying gaze of the lesser black-backed gulls, who prey upon the eggs of this and other species whenever the opportunity occurs. When suddenly disturbed from the nest, the duck has a nasty habit of fouling it, and, as most ornithologists know, the stench thus caused is very powerful and disagreeable. Eiders will swallow large mussels, shells and all, as much as $2\frac{1}{2}$ inches in length.

The Puffin (Fratercula arctica).—This species usually arrives on the Farnes about April 15, leaving about September 5, being a summer migrant. The puffin swarms on the Staples, where it nests in holes burrowed out in the peaty soil by the birds, and in which it deposits its one egg, which is white in colour. Young puffins are mere balls of black down. It also breeds on the North and South Wamses. The puffin is also known by the name of parrot, on account of its parrot-like beak, and also as Tammy-norie. In many parts of the world, notably St. Kilda and Iceland, puffins are eaten in great numbers by the inhabitants.

The Guillemot (Uria troile), also called scoot, deposits its one egg, which varies immensely in colour, markings, and size, on the bare rock, and on the Farnes is almost



[Photo—A. H. Robinson, Scalby.

THE FARNE ISLANDS.

entirely confined to the Pinnacles—four flat-topped rocks, each some twenty to thirty feet square, separated by a chasm about twenty feet wide from the Staples. The tops of the Pinnacles during the breeding season are literally covered with about as many guillemots as can find standing room, each bird brooding its single egg. A few razorbills also occur, along with guillemots. The Pinnacles are amongst the best places in Great Britain or Ireland for studying the habits of the guillemots at short range (*i.e.*, about twenty feet) distance.

II.

Mr. Stanley Duncan, Hon. Secretary of the Wild Fowling Association, in his interesting article on "British Wild Fowling and Pleasure Resorts," says:—

"On journeying south from Holy Island our first place to stay, if desirous of shooting along Fenhamslakes and Budle Bay, is Elwick, situated about two miles from the north-west corner of Budle Bay and a mile from Fenhamslake. Along this shore a shoulder gun wild fowler would find, in suitable weather, many excellent fowl worthy of much trouble to obtain.

Wigeon are usually exceedingly numerous, especially during hard weather, and mallards are often in as large droves. Sometimes these birds flock upon the stake like clouds or swarms of bees. To see them in such large numbers is worth to a wild fowler all the time spent if one should be so extremely unfortunate as to bag none, though this would rarely happen to an average shot staying in this neighbourhood for a few days when the birds are there.

Brent, too, are frequenters of this coast, at times in myriads. The main portion of the *brent* are shot by the punters, who, by the way, are in nearly all places, the wild fowlers securing the "cream of the fowl." As I take it, the true shoulder gun wild fowler is not so desirous of obtaining large numbers of fowl as a warm and jolly piece

of wild sport; the idea of record breaking should be only a secondary consideration.

Our next village of note is Bamburgh, where close by stands the old castle of that name towering above its surroundings. The coast from Budle Bay to Bamburgh is not of a very entertaining nature to the wild fowler, being out of the bounds of the famous Holy Island fowling grounds. Beyond the chance of some stray fowl at irregular times, nothing further may be expected. It is not likely that a shore shooter will long haunt a bit of coast when he knows that a few miles in either direction will find better sport.

Bamburgh is the birth-place of the world-known Grace Darling, who so heroically aided in the rescue of the crew of the "Forfarshire" on the Farne Islands. Beyond this, Bamburgh might be passed, as far as these papers are concerned. In the sandhills north of Bamburgh a few pairs of shell-ducks breed nearly every summer, but are so wily in their habits that they cleverly escape casual observation.

Leaving Bamburgh, we soon come to Seahouses and North Sunderland, which are close to each other, the former being approached first. At Seahouses there is a small harbour, chiefly for fishing boats and the like. Here it is that visitors to the noted Farne Islands "take off." Before describing the islands, which do not fail to interest all the community at large, to say nothing of the ornithologist and the wild fowler, it, perhaps, would be more fitting to state that from Chathill, on the main line, there is a light railway, which conveys visitors and others almost to the scene of the starting-point for the islands.

The Farne Islands in the winter afford capital shelter for most kinds of our sea-ducks, amongst which the eider is a prominent species. The sport of shooting these ducks is usually practised from a boat, the fishing coble being the most suitable for this coast. Boats can be hired at Seahouses; but it should be remembered that a crew of at

least three hands is necessary to man a coble for this work, as the task is, even in mild weather, really a rough one, so strong are the tidal influences round these islands. Beyond the sea-ducks and a few other sea birds, such as divers, little else may be expected."

A Night of Wild Fowling.

In the Marshes of North Kent.

A HARD blue sky is overhead, without a vestige of cloud; the wind blowing keen from the east, and the marshes covered with frozen snow, so deep in many places that few travellers would dare venture out there; but I want birds as specimens, and the long-continued cold has made them tame.

The tide is running up and the birds are on flight from place to place. There are very treacherous traps for the unwary in the Saltings—that meadow-like space left between the salt water and the sea wall. To look at it you would think it easy travelling, but the thick growth of the sea blite and coarse grass and rush conceal the runs and dykes made by the rush of the tide, some of which lead to the sluice-gates in the sea wall. The force of the tide opens these in flowing up, and fills all the dykes; when the ebb takes place the gates close again. Four, five, to eight feet in depth these runs and dykes are; only a marshman can go safely over these places.

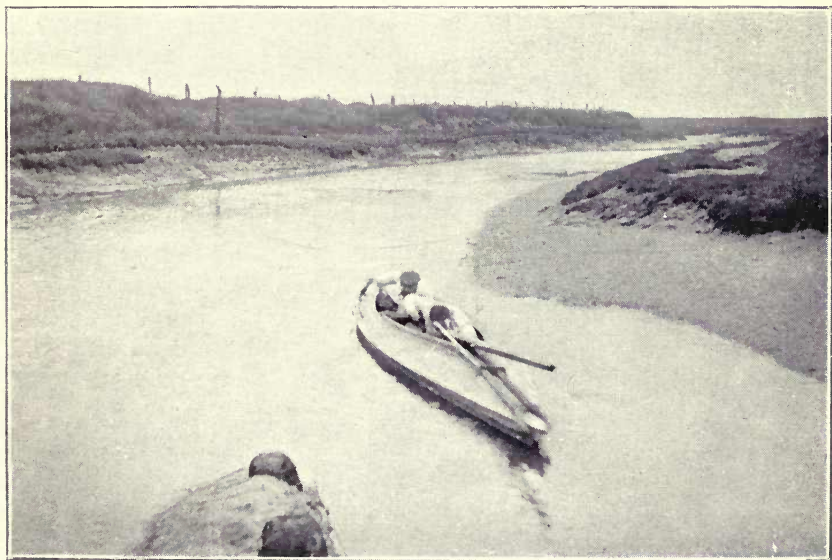
Nothing is to be seen yet but a few hooded crows on the prowl. It is no use to think of shooting the saltings just now, so we turn into the marsh to look about for a bit; and the *Curlews* (*Numenius arquata*) screaming will let us know when the tide has turned.

What a long dreary space it is, covered with glittering snow! But the cold is fearful, and a bird will not leave shelter if he can possibly help it; so we tramp on in the hope of a chance shot. Here and there we come upon the



[Photo—S. H. Smith, York.

CRIPPLE STOPPING.



[Photo—S. H. Smith, York.

TILTING THE GUN FOR A FLYING SHOT.

footprints of a heron, for the snow is soft round the margins of the springs. The other birds do not like him, for he is always hungry, and his stomach is very accommodating.

Near some pollard willows some starved-out fieldfares are bunched up. They utter a feeble "chuck" at times; their feathers are puffed out, making them look twice their natural size. A gull comes flapping over on the hunt, for a dead or wounded bird is a nice meal for him. From a bunch of dead flags with a scape-scape-scape up springs a snipe, with that twist-and-turn-about flight peculiar to himself and his relatives. He is not fired at, for if there are any fowl in hiding anywhere in his line of flight that cry will move them.

It has done so. Three mallards rise from a dyke; they are low down, and fly straight to where I am standing by the willows; three in a line, their green heads glistening in the sun—for it is morning—and the red-brown of their breasts is showing distinctly. They are near enough now, I think—two of them, at any rate.

"Bang!" "Quack, quack!" A twist and turn of their necks and bodies tells that they have been hit, but they do not fall. It serves one right, for it is almost useless firing at fowl coming right at you; the breast feathers are so thick. It is a warning to resist temptation for the future.

As we near the Saltings, something springs from a patch of dead flag, which we shoot, and it proves to be a fine specimen of the *Short-eared Owl* (*Strix brachyotos*) or "woodcock owl" of the marshmen. His light body and hawk-like flight often lead folks to take him for some other bird. He hunts by day as well as in the evening; any hen-footed fowl is his prey—that is, if it is not too big for him.

The shore-shooters know him well; they see him, just as the light begins to fade, come skimming over the flats, now high up, the next moment close to the ground. All at once he stops, and fans with his wings, like a kestrel, over a tuft of rushes. That fanning of the wings is remarkable; it causes a current of air, much stronger than

any one would imagine, which rattles and stirs the dry rushes, so that any creature that has sheltered there comes out, and the owl gets it. His near relative, the long-eared owl, has the same tactics. They do not eat all they catch at the time, but hide it till wanted, and the contents of their larder would surprise many people.

Gaining the foot of the sea wall, we crouch down for shelter, and listen for the notes of the fowl, driven by the fierce wind off the open sea to seek harbour in the bays then comes the screaming of the redshanks, the cackle of gulls, and the cry of *Tern* (*Sterna hirundo*); all combined with the peculiar chatter of thousands of *Dunlins* or *Oxbirds* (*Tringa variabilis*).

The fowl are coming up with the wind, so, crawling up the bank, we peep very cautiously out over the Saltings and down the creek. The whole place is alive with hen and web-footed fowl; only a mile away a line of birds is to be seen coming over from the opposite shore; we get quickly back to the bottom of the wall and wait for them.

The whistle of their wings is first heard, and then we can distinguish them. Wigeon they are, the feathers underneath shining like white satin. Picking out the leader as he passes by, and aiming a yard in front, we bring him down with a thud—dead. And now the fowl are on the Saltings; their scream, chatter, quack, and whistle, all mixed up together, while from the other side of the water comes the sound of the heavy duck guns hard at work.

We slip over the wall, and begin to crawl on hands and knees to the fowl feeding on the very edge of the ebb-tide. Curlews are not to be thought of; they know exactly how far a gun will reach, and keep just the right distance out of harm's way. Besides, they post one of their number for sentry duty. The redshanks are nearly as bad, for they kick up a noise, and let all the other birds know that something is crawling along.

Getting under the shelter of the wall, I made my way lower down to the tide, where, crouching under the



[Photo - S. H. Smith, York.

"A SUCCESSFUL MORNING." PUNT SHOOTING.



MR. SYDNEY H. SMITH (OF THE WILDFOWLERS' ASSOCIATION) GOING ABOARD.

remains of a stack of reeds, I found a "shore shooter," one who makes his living by means of his gun. By some unlucky chance he had forgotten to fill his powder-flask. The birds are well up on the Saltings, and he has only enough for another charge for his duck gun. Could I oblige him with a charge? he asked.

"Certainly, with half-a-dozen, if you like," is my reply.

"I can't afford to shoot them little hen-footed things," he remarks. "Powder and shot cost money. Are you after something to stuff?"

"Well, yes; something in that way."

"Ah, I fancied you was by your shootin'. You let some fowl go by that I should have pulled at. You don't shoot for a livin'?"

"No, I do not."

"Shall you be down this part any more, think you?"

"Yes, I may, for anything I know."

"Well, there's some of your sort of birds about here, what you're after, and I could knock a few over for you. Would this one be any good to you? If it is, take it."

I was glad to have it, for it was a fine specimen of the *Kentish Plover*, or *Dotterel* (*Charadrius cantianus*)—a rare bird even here.

"Can you live by your gun?" I asked.

"Sometimes; last winter I did well, though it was by chance like! It come about this way. I had to go to the marshes at the back of the island—Sheerness. You don't know it, do you?"

"I know it well, a shallow part especially, covered over with sea grass and weed, and a good nine miles from here."

"Ah, that's it! The geese are well sheltered there, with plenty of food, and they'd gathered from all parts. I brought home three couple on my first night, and sold 'em. Then I bought myself powder and shot, and a few other things, and went to work. Well, all through that winter I managed to live; rough work at times, mind you,

but I lived, and that's somethin'. I allays keeps me own secrets. My line of work is shootin' fowl, an' I don't want anybody to help me!"

I gathered afterwards on the trudge home that my companion made a very good living indeed, though he made little noise and much less boast.



[Photo—S. H. Smith, York.

“TAKING THE BREECHLOADER ABOARD.”



[Photo—S. H. Smith, York.

“THE PUNT UNDER SAIL.”

A Few Comments on the Sport.

Punt-Shooting versus Shore-Shooting.

NO one appears to have anything to say against the practice of shooting birds from the shore, or even with the shoulder gun on the stakes, but with the punt gunner it is totally different, if one may judge by the antagonism shown in the local press, at times.

The sport of punting is variously summed up and condemned by those who do not possess a shooting punt. It is called murder, massacre, butchery, &c., &c., the different degrees of nomenclature varying probably with the dislike, petty spite, or jealousy of the different critics.

The view which I have always held in relation to this matter is that undoubtedly punt shooting is one of the kings of sport, and it calls forth all the skill, patience, and energy requisite in a successful shore shooter, and a great deal more wariness and science are required in the punter, in his method of approaching his prey; therefore, why all this adverse criticism?

One can well imagine the exultation which necessarily fills the breast of the individual who has, with one discharge, captured a modest quarter of a hundred birds. Neither can I regard as inhuman punt shooting, for every precaution is taken, at all shoots, to kill, with the hand gun, all birds that have been winged or only slightly wounded.

How I Became a Naturalist.

MY home as a boy was in a quaint old fishing village close to the edge of the North Kent marshes. The place had an old, irregular look; one would think its inhabitants had begun building from the shore inland to a certain point, and then come back and finished along the water's edge.

The top rooms of the houses generally projected over the pavement—somewhat savouring of Shakesperian—with queer gables, which were ornamented with grotesque figures. By the water stood old mills, warehouses, and shipyards, all having a decayed look. That business of some kind had been once carried on there, the old wharves and fine houses showed, but when that time was no one about the place in my time knew. It was entirely isolated from any other town or village, and railroads and steamboats were things known only by name to the general community. Nearly all the people got their living on the water. Poor they were, but a contented lot, and, as this world runs, honest. Now and again it would be gently hinted that they smuggled—who can say? The virtuous have enemies; they, perhaps, had theirs. One thing I can testify—if at any time a little medicine was needed, it was sure to come out of a very short-necked, dark-green bottle holding more than a pint, and that medicine was certainly made in Holland.

The fishermen and their lads always passed our house on their way to and from their fishing boats, which lay at anchor below in the marshes. On the return journey they were sure to have something in the shape of wild fowl—for you would find a duck gun on board all the boats—and

to catch a sight of these was my principal delight. When they found out this they never passed the door without showing "the boy" what they had got. Many were the questions I asked them about bird and fish, and I never rested until the kind-hearted fisher-lads had taken me with them to see for myself the birds they talked about.

Before long I knew where to look for the birds, and could mimic their cries—the shriek of the curlew and his mournful whistle, the *Peewit* (*Vanellus cristatus*), and the note of the *Stone Curlew* (*Edicnemus crepitans*), or thick-knee (called in the marshes "the king of the curlews"). I had plenty of room to move about, and no one interfered with me or the birds. The Bird Preservation Act was not thought of at that time. The plover's eggs were left for the bird to hatch, and if the young were picked up just to look at they would be gently put down again. Bird and egg-collectors had not reached our neighbourhood then. The miles of marshland teemed with bird-life. When the gun was used it was for the wild fowl proper—geese, duck, wigeon, teal—but the waders that gave life to the dreary-looking pools were little troubled, for powder and shot with the fishermen meant money. When they fired at a bird they shot at something that would do for dinner.

I had watched the life on the marshes at all hours of day and night—in the early morning, when the mist rolled over the lands and the scattered poplars and stunted willows took strange shapes, while the red hares flicked the wet off their hind feet as they sat on the mole hillocks, and at midday, when the gulls left the sea to come to the hollow marsh pools to bathe and rest—a pretty sight. With them would be seen the peewits and *Red-legged Sandpipers* (*Scolopax calidris*). One would hear them, too—the cackle of the gulls, the "pewit, pewit," of the green plover, and the scream of the redshank. In the evening flight after flight of starlings made their way over the flats to meet in one vast host to go through their drill before settling for the night in the reeds. At one particular hour of the afternoon, in summer—between five and six

o'clock—the marshes shone in a golden light, which tinted all things far and near (just such a tone as Cuyp gave to his marsh scenes), and, to complete the picture, one saw the men-o'-war, frigates, and sloops off the mouth of Medway in the distance. Turner visited our marshes and painted some of his famous pictures from what he saw there, to wit, "Stangate Creek," "Shrimping Sands," and "Off Sheerness."

My companions in our village were at times what the present more refined state of society might term "doubtful." They lived by the gun, but they were good to me, and would take me with them over the Saltings, close to heel, ready to drop or crawl at a motion when the water-spaniel got the scent of fowl. Sure shots and true field-naturalists, they knew them all and where to find them. I owe my early insight into bird-life to these men and to an inborn love of all living creatures. Coming past the long, shallow pools, my companions would point out the various waders, their bodies reflected in the clear water by the light of the setting sun, and the tern, with his shuttlecock flight, catching insects and small fish.

The man with whom I went out oftenest told me of a struggle he once had with a great sea-eagle that was shot in the wing on the rabbit-links in the marsh just enough to prevent his rising.

I remember, too, one of my school companions, not much more than a boy, going out with a borrowed boat and a gun and shooting a wild swan—a fine Hooper—dead with his first shot on a rising tide.

A good mile from our village stood the grand old parish church, with its massive square tower built of flint stones, a prominent object, which can be seen from far over the water. The interior of the church is very beautiful.

When I was about twenty years of age domestic changes caused me to leave my old marshland home. I parted with my old companions and kind friends with sorrow. Just as I was going a hamper was brought. It was a parting

gift, and contained water-birds and waders captured by the fishermen and their lads.

A very good authority remarks:—Verily, one man's meat is another's poison, and the iron-bound ground which puts a stop to hunting and spoils other winter sport comes as a boon to the fowler. Early and late he is enjoying sport. He steals off in the morning, and obtains a bag, often before his neighbours are out of bed. Again, in the evening he is flight-shooting, sheltered, if possible, from the keen wintry blast, until silhouetted against the western sky he sees a thin line which warns him of the approach of fowl, travelling at, perhaps, sixty miles an hour. Maybe they will pass near his hiding-place, if it be well chosen, and he may have time for a double-barrelled salute before the advance guard sweeps away into the darkness. Then he reloads the gun and puts it at ease to await the next chance. The various species of wild fowl sought by the gunner may be set down as legion.

The remark that a duck will live anywhere, upon anything, is almost correct. We might call him omnivorous. This more especially applies to the domesticated variety, which has a predilection for refuse, and a shame-faced love for anything too "high" for other inhabitants of the farmyard. His wild cousin is, in most cases, far more particular. Indeed, unless in a starving condition, he is epicurean in his tastes. Even as the canvas-back duck, beloved of the gourmet, obtains his distinctive flavour from a diet of the delicate wild celery, so the mallard wants one quality of food—the best—and nearly always contrives to get it. Succulent herbage, seakale, mollusc, crustacea, grain, berries, and pulse form part of his bill of fare. He fattens on the stubble fields inland, and then flies to the ooze beside river and estuary to plunge his sensitive bill in the soft mud and distil nourishment therefrom in the shape of amphibious insect life. Compared with the domestic bird, it is an instance of Hyperion to a satyr. Domesticity has infected the tame duck with a waddle and dimmed his lustre. At mating time, when the wild variety

puts on its bravest attire, we have few British birds to vie with him. His helm is of brilliant metallic green. A white gorget parts his morion from the ruddy chocolate of the breast, chestnut-brown is his mantle, and brilliant orange his legs and feet. He walks erect, and with none of the awkwardness of his tame relation. His sex is indicated by the four lyre-shaped middle feathers of the tail, which curl upward and outward. A somewhat curious chapter can be filched from the book of Nature upon the courting of duck and drake. We put him in the second place, because the maid makes the wooing. She is sombre of hue, while he, clad in all the glories of colour, remains to be approached. She sails round him, uttering cooing notes of love; while he, to all appearances indifferent, acts the part of a coquette, avoiding her advances. She redoubles her efforts, swimming round him, and occasionally lowers herself in the water until only the head and neck are visible. Reciprocal feelings eventually being established, the pair go through a series of seemingly concealed figures, advancing, retiring, bowing their heads, and uttering notes of endearment. This is preliminary to the construction of a nest, which is usually placed in the midst of a tuft of rushes, in the hollow of an old tree stump, or occasionally in a pollard tree, twenty or more feet from the ground. This is more especially the case when there are many four-footed enemies about. The drake takes no part in the nest-making; all these duties are performed by his mate. When the nest is finished, she lays from ten to twenty eggs—usually about a dozen—and as soon as she begins to sit, plucks the down from her breast to prevent the eggs from getting cold while she is away from the nest, which she never leaves until forced to do so by the pangs of hunger. Even then she carefully conceals her treasures by putting herbage over them, as she may have to fly many miles in search of food. The drake does not assist the incubation in any way. He goes to his club with other drakes, only occasionally flying round overhead and quacking loudly. This seems to be done less with an idea

of cheering her long vigil than of assuring his anxious mate that he is all right. After twenty-eight days' close sitting, the brown, downy brood hatches out, delighting the maternal heart. Strange to say, after all her solicitude, she is strangely lacking in prudence. She will march her brood over long distances, never looking behind her, until some drop from exhaustion. Then, again, otters and pike devour them in the water, and cats and other enemies on land; indeed, it is a wonder how any of them survive.

The brent goose is the most common, and a general object of interest to the fowler. He can easily be distinguished from other geese at a distance, the beak, head, and neck, breast, tail, and feet being deep black. The back is slate-grey, and upon each side of the neck he has a white patch. The female has similar plumage. Unlike other geese, the brent never feeds on dry land, nor have we seen him on land. He gathers his sustenance from the seashore and in the estuaries, frequenting the ooze and shallow water, and collecting floating seaweed, and more especially sea grass. This latter is the favourite food, and in the presence of brent, or black geese, as they are often termed, can at once be recognised, as, while other wild geese bite off wet grass as if cut with a pair of shears, the brent tears it up, eating the white part of the root, and throwing the other away. Brent visit these islands in thousands, and, no matter how vigorous the gunning may be, it only renders them more wary, but does not drive the flocks away.

With regard to guns and ammunition, as upon most other subjects, the doctors differ. Under such circumstances, wise sportsmen steer a course of their own, and when doing this we have found that, as far as shore-shooting is concerned, heavy guns are a mistake. Some persons will advocate a double-barrel 8-bore. Now, this is not only an ammunition-wasting weapon, but terribly cumbersome in the strongest hands. If an 8-bore must be carried, let it be a single-barrel, as it is quickly loaded. What, however, can beat a 12-bore double with

3½dr. of powder and 1½oz. of No. 4 shot? It will stop anything, even a Hooper swan, and, as it weighs only about 7lb. or 8lb., the weight is not excessive. It should be furnished with a shoulder strap or sling, to leave the hands free when birds are not near. In our opinion, the only proper place to use a large shoulder-gun is from a boat. As far as powders are concerned, we prefer the white nitro compounds, as black powder, even if it hits harder, generates so much smoke that it is a nuisance in heavy weather. No shot should be without a supply of brass cartridge cases. They can be charged several times, do not stick or jam in the gun, and hit much harder than cardboard cases.

A day with duck properly carried through is not only an exciting but a very arduous amusement. Of course, it depends upon the state of tide when the punt is taken out. It should be at flood—that is, when the tide is turning to run; never at high tide or on the ebb, as it only frightens them. After a good meal and something in the punt to go on with, a companion to propel the punt is necessary, and, in addition to the long swivel, a good double-barrel cripple-stopper must go on board. One cannot wear too much flannel clothing, consistently with freedom of movement, as the nor'easter in the estuary is keen, and goes through thin clothing like a knife. Birds are scattered in all directions on the breast of the heaving waters—sheldrake and pintail, shoveller and scaup; but brent, wigeon, and mallard are more in the mind. A sweep of the field-glasses reveals several bunches of wigeon drifting towards the flats and sand-dunes, while a gaggle of brent geese are calling as they sweep in great circles over the ooze, seeking a suitable place to pitch. Further on, too, are mallard in goodly numbers, while the bean geese are sweeping to the stubble fields. How to get at them is the rub! The long, cold paddle is only sustained by the wrought-up excitement. The wind is rising and knocking the punt about; but this is all the better, as far as fowl are concerned, as it tames them. The punt is pushed on,

interposing every object possible between the fowlers and the fowl. It is becoming dangerous enough for the punt, but the gaggle of brent geese are huddled together on the ooze—they do not like their feathers ruffled by that bitter blast. Slowly the distance decreases from 150 to 120 yards; then to 100. This is the exciting time, as 70 yards is quite far enough away with a dancing punt on a rolling sea. The sentinels appear to be uneasy as the range lessens, and at about 75 yards the flocks raise their pinions. Simultaneously the 8ft. thunderer hurls 11lb. of heavy shot among them as they open their wings, and, quick as thought, the second barrel goes in the retreating remainder, from which “droppers” fall out—thirteen dead and six cripples is enough to go on with. The cripple-stopper accounted for all but one wounded, which escaped to sea.

There is a heavy surf on the bar, the gulls are driving inshore, and the sea-horses look angry. It will be a wild night. So much the better; the higher the wind, the lower the birds. The powdered snow drifts sharp on the wind. Heavy clouds partially blot out the moon's rays, and the “whe-oh” of the wigeon has something almost eerie in it. Now for the 12-bores, wire cartridges, and No. 4 shot. The cutting nor'-easter makes us glad enough to crouch under the old sea-wall. The wigeon call grows nearer and louder; swiftly some dark blots frame in the sky; the guns speak, and there is that heavy “splosh!” so loved of the shooter. It is not a wigeon, when retrieved, but a fine mallard. First blood to the gun! Then follow in rapid succession a gaggle of bean geese, too high, a leash of pintail, two of which pay forfeit, and the trumpet call of an invisible Hooper. Then, fast and furious, for twenty minutes, teal, pintail, mallard, wigeon, and curlew succeed. It is hard work to load, so rapid is the succession; and, as is always the case, a lot of unlucky shooting occurs, as in the deceptive light a judgment of pace and distance is all but impossible. Twenty minutes of hot work, and the flight is over, ceasing as suddenly as it began.

Bird Migration.

UNTIL the last few years it was generally believed by naturalists and ornithologists alike that in migration the older or parent birds preceded the younger ones on their long flight, and even eminent authorities on bird life fell into this error.

Expressed in the simplest language, the incontestable result of all the numerous phenomena as they came under notice in a certain North Sea observatory is as follows :—

- (1) That under normal conditions in the case of over three hundred specimens, with the exception of a single one, the autumn migration is initiated by the young birds from about six to eight weeks after leaving their nests.
- (2) That the parents of these do not follow till one or two months later.
- (3) That of these old birds the most handsome old males are the last to set out on the migratory journey.

The only exception to this rule, as previously mentioned, is the cuckoo, and this for reasons easy to divine. Plumage enters a great deal into the art of ascertaining the old from the young whilst on the wing. The marking and colour of such birds as the starling would at once identify the age. The blackbird, again, is another species in the case of which the time of migration in respect to age and sex can be determined with the utmost exactness by reason of the difference between their early and adult plumages. The young reddish-brown birds with which the migration commences rarely make their appearance before, say, October; the old black males defer their arrival till November, and of these latter again the last to arrive, some weeks later, are the beautiful glossy blackbirds with orange-yellow bills.



[Photo—S. H. Smith, York.]

METHOD OF WALKING OVER CLIFF-EDGE.

In regard to the difference of time of migration of young and old birds, it would be well to quote a remark or two from an excellent authority, viz., "Rodd's Birds of Cornwall and the Scilly Isles." Speaking of the knot, the author mentions: "I have also noticed that the first flocks of these migratory sandpipers, which usually arrive about the second week in August, are almost entirely composed of young birds. The old birds arrive somewhat later." Referring to the woodcock, the same book says: "When it first comes its flesh is short and tender, whereas afterwards it eats stringy and is of a fibrous flesh, as others of our fowls are."

Even to the scientist in Nature study it appears mysterious that young birds of, say from eight to ten weeks old are able successfully to complete a lengthy aerial journey of some five hundred miles in the greatest safety. It must be borne in mind that this is a maiden venture, or original undertaking; yet the same unerring certainty is there as practised by their parents previously. Anyone who on dark, starless nights has heard the babel of voices of these myriads of migrants travelling past him overhead, in one fixed direction and in undiminishing numbers, for weeks and months, without the help of any guiding mark discernible by the human eye, cannot fail to be led by the supreme grandeur of this phenomenon to speculate as to what kind of capacities the unfailing performance of such an act is due.

For centuries this question has received the most serious consideration on the part of inquirers, but no final solution of the problem has as yet been forthcoming. The greatest amount of investigation of these unknown things produces, seemingly, but the chaos of nothingness; hence, in their perplexity to account for this remarkable phenomenon, scientists and observers have sought refuge in the assumption of an "instinctive action" (as Gatke puts it) on the part of birds, in virtue of which they adopted unconsciously the right road towards the attainment of an unknown goal. Alfred Newton's remarks on "Birds" in the "Encyclopædia

Britannica" rejects the idea of instinct as a mere evasion of the difficulty of the question, and as excluding all scientific investigation of the same. According to his view, birds act unconsciously in a manner suited to a certain purpose; but what, one might ask, is this but instinct?

The absorbingly interesting subject of bird migration is one that cannot be dealt with in a few cursory notes, or in any wise scantily treated, for whatever theory is advanced the idea baffles the most devoted student of natural history.

An excellent authority very ably puts it thus—and this view is the one now generally adopted on this question:—

"Originally birds lived in latitudes which supplied them throughout the whole year with everything necessary to their existence; that in progress of time some of them accidentally came to stray so far beyond the northern limit of their home that on the approach of winter they were compelled to retrace their path thither in order not to succumb to cold and hunger: that a habit of migration was developed from such accidental erratic wanderings, and that this habit, together with the experiences made on these journeys, had been passed on by inheritance from the old birds to their young."

He further states that the flock of migrants generally had for their leaders older and stronger individuals: that the young were not possessed of an inborn consciousness of the necessity of migration, but had to learn all this from their parents.

The roads frequently travelled over by these old birds consisted of a succession of spots favourable for taking rest; or feeding grounds on which they were dependent, and the so-called routes of migration were determined by the geographical situation of such places. Such young birds again, as travel alone, are further credited with the possession of a so-called local sense or local memory. This is acquired at first by their getting to know such feeding-grounds as are situated in the immediate vicinity

of their nests, impressing these upon their memory, then discovering others further removed, and so on. Supported by this knowledge of stations where food may be obtained, the young birds are now left to their own resources to find the way to their winter quarters.

It may not be out of place here to refer to the inexplicable manner in which dogs are able to find their way back to their homes from very long distances. A friend of the writer had occasion to send a dog by train on a long journey, at the end of which, however, he managed to escape, reappearing a few days after in a very emaciated condition, having scampered the sixty or more miles without food till the homestead was reached. Another instance, a pet dachshund, about a year old, was put into a sack on the estate of its owner, and conveyed in a close cart to a farm miles away. Arrived at its destination, the dog was liberated, but disappeared, and was back home again before the conveyance returned! Some farm hands stated that the animal was seen going "as the crow flies" across ditches and through hedges in a direct line for home.

On the trackless plains of North America cattle, after having been driven for hundreds of miles, have followed the same method of returning, oft-times through brushwood and dense forests.

So far, mention has been made of the land routes of the migratory species. It is now my intention to bring under the reader's notice a theory which has been established to explain the crossing of wide seas by this host, more especially in relation to the occurrence of American birds in Europe.

As already intimated, it was considered absolutely impossible for a bird to traverse a stretch of water at least sixteen hundred miles in breadth, which is the extent of the Atlantic between Newfoundland and Ireland. Hence it was believed that the only way in which it could accomplish this journey was by making use of what are called "diluvial land bridges." These at the present day are

represented by the mere isolated remnants of what, in primary geological periods, were large land connections between different continents.

In the case of birds crossing over from America to Europe, such a connection is assumed to be formed by Greenland, Iceland, the Faroes, Shetland and Orkney Islands. The employment of this path as a migration route is considered to have developed into a habit, and this habit to have passed by hereditary transmission from one generation to another from primitive times down to the present day, so that the birds now in existence are able to find their way with perfect certainty from one to another of these mutilated remnants of a previously continuous chain of land in spite of the fact that these detached fragments lie far beyond their range of vision.

Italy, which at one time connected Europe with Africa, dividing the Mediterranean into two inland lakes, is said to have formed a land bridge of this kind for birds exchanging their habitations between these two continents.

As to the arrival and departure of our friends the migrants, I am at one with an eminent practical fowler, who, in his writings, talks as one who has well studied his subject. I refer to Mr. Stanley Duncan, of Hull, and I cannot do better than to copy, with his kind permission, his remarks as follow :—

“Some notes relative to the dates on which numbers of our shore-birds and wild fowl visit or reach our shores from their breeding homes and northern haunts may here be very fitting.

Several species of shore-birds and wild fowl breed in our islands, but their numbers (even if all stayed the year round), are very small compared with those which reach us from the north. What are known as residential birds, such as the redshank, curlew, green plover, golden plover, dunlin, mallard, and teal, by the end of July begin to flock on the coast, either from our local breeding-grounds or from those abroad. In August most of the curlew and golden plover have left their moorland haunts and resorted

to quarters adjacent to the coast. In this same month large numbers of knot, godwit, whimbrel, and mature grey plover arrive; also the less plentiful green sandpiper, common sandpiper, and greenshank are in strong evidence. At this season oyster-catchers, turnstones, sanderlings, and many other species are to be met with flying the coast-line in search of new quarters. In August also the home-bred mallard have flocked, and daily wing to the estuaries and other safe retreats.

The beginning of September brings an increase in the number of birds on the coast. Great flocks of gulls and terns, leaving their sea-bound breeding homes for more southern climes, may be seen. At this time the curlew, sandpiper, little stint, and other less numerous birds pay us a passing visit. They stay from a week to a fortnight with us, then depart for the south. By the middle of September the full swing of shore-bird migration is in operation. A noticeable increase in curlews (noted by their different manners and unwary movements) occurs in October. Shore-birds are in this month as numerous as they will be, if no severe weather influences an immigration from the Continent. Thus, in the months of January and February, knots, in very hard winters, congregate in enormous flocks on our coasts.

In August some local migration of wild fowl takes place. We are in this month visited by the first lots of mallard leaving their breeding haunts, as well as other fowl, such as shovellers, teal, tufted duck, and pochards. A few wigeon—probably those which breed in the northern parts of Scotland or at no higher latitude—are often met with in England during August. Of course, a few odd pairs breed in England, but the wigeon seen in August undoubtedly outnumber those which breed in this country.

October brings with it the arrival of large numbers of wigeon and mallard, but the latter species may be said to come in the largest flocks in November. Grey geese reach us in force during October, and increase until the end of November. Some pass further south. In February they

return, and during this month are most numerous on the tideways. Whether large numbers of grey geese (pink-footed) which have journeyed south along the Continent return *viâ* the British Isles I cannot say, but it is undoubted that when these birds are congregating to go north they are seen in the largest flocks.

Brent, compared with other fowl, reach us late. Few are here before November, and in general they are not looked for in great numbers until after Christmas. The severity of a winter has much to do with the number of brent which reach our shores. Their proper migratory season is over long before the inclement weather drives them in big lots to the British Isles; thus it might be stated that brent, and to an extent all geese, are subject to local migration, which is partly governed by the weather. Of course, brent occur every year, but for great numbers to visit us we are much dependent on the severity of the winter on the Continent. The severity of our winters count as little on this score, except that when hard the fowl are not so difficult to procure.

Bernacle, although allied to brent, more closely resemble the grey geese in their migratory movements. Being marsh-feeders, bernacle geese frequent very local areas in our islands. The bernacle has frequently been shot in August. At this season they have been met with at places which are not usually visited by them. As this fowl is fairly common as an ornamental water fowl, it may be possible that these early visitors are "escapes."

In spring a return of the fowl and shore-birds takes place. The wild fowl leave us in the majority first. The shore-birds which have wintered further south, such as the whimbrel and curlew-sandpiper pass our shores in May. A few linger until the first week in June. All the summer a few straggling shore-birds may be seen on the coast, including godwits, turnstones, grey plover, sanderlings, and knots. These may be immature which have not gone on to breed, or possibly they are either barren or 'pricked' birds."

Bird Migration from America to Europe.

THE occurrence of so many American species on European soil involuntarily suggests the question as to the possible route by which these birds may have reached us from their distant homes. That they should have crossed that vast waste of water, the Atlantic, was at first either disbelieved or only admitted with much reserve, mainly because it was considered quite impossible for a bird to sustain the uninterrupted flight of at least sixteen hundred geographical miles involved in such a journey.

Instead of at once entering into the consideration as to the possibility of such a feat, it would perhaps be wiser to examine which of the two routes leading from America to Europe seems more likely to be adopted by migrants—that to the east over the ocean or, otherwise, the so-called overland route through Asia and Eastern Europe.

For this purpose a comparison of the lists of rare and exceptional occurrences in Germany with that of the similar occurrences in England at one glance decides this question in a most convincing manner, because, whereas Germany can show an unexampled number of Asiatic species, with only extremely isolated instances of American birds, England marshals a perfect flood of American species and individuals, among which only a few scattered visitors from Asia are found.

These facts speak clearly enough; it is impossible that two hundred and fifty birds should travel from America through Asia and the greater part of the continent of Europe to England without more than ten of their number being observed or killed in Germany; on the other hand,

all the facts point to the conclusion that the birds reach the coast of England direct by way of the great Atlantic. Nor, indeed, could a large number of birds like that have travelled *viâ* Greenland, Iceland, and the Faroes, as one might feel inclined to assume, without leaving behind them more extensive traces than it has been possible, in spite of all efforts, to obtain.

It has also been long known that ships half way between Europe and America have fallen in with birds travelling, either singly or in flocks, in an easterly direction, migrants of this kind having not rarely attempted to alight upon the rigging, and some having also been caught there. A case of this kind is mentioned by no less an authority than Professor Alfred Newton, according to whom Dr. Dewar observed on his passage from America, about six hundred geographical miles east of Newfoundland, flocks of the American white-winged crossbill crossing the Atlantic in a stiff westerly breeze. Many of the flocks alighted on the rigging of the ship, and of these twelve examples were captured. One or two of the latter escaped as the ship reached the Irish coast, and made straight for the land. Two others succeeded in escaping from their cages in the streets of Liverpool, and five were safely brought home. The Professor draws the conclusion that many others are thus helped across the streak by human aid—with what success may be inferred from the American element in the list of so-called British birds.

If strong westerly winds were the cause of, or exercised an influence upon, the migration of American birds to Europe, as has evidently been assumed to be the case, the plover should be subject to such influences to a far wider extent than any other species whose home is on the other side of the Atlantic, for amongst the enormous flocks of these birds which cross that ocean from north to south one might expect that a violent westerly autumn breeze would in all likelihood drive some individual or other less robust than the rest across to the shores of Europe. Such, however, is not the case; whence the fact

of the non-appearance of this plover in Europe supplies far weightier evidence against the theory of migrants being driven out of their course by storms than all the known instances of the occurrence of strangers ever furnished in its favour.

At the time when the question of a possible flight from America to Europe was first mooted, an achievement of this kind appeared utterly beyond the capacity for flight possessed by birds, so far as this was understood, and consequently was dismissed as impossible, without being even deemed worthy of further investigation. Harting still remains very undecided in his opinion on this question. Thus in one place he says that it is extremely hard to believe that birds, other than natatorial species, should have succeeded in crossing the Atlantic, but adds that most of them nevertheless have accomplished this feat, because, on the one hand, many which have occurred in England or Ireland have never been observed anywhere on the continent of Europe. He, however, considerably weakens his argument when he goes on to say that there was probably good reason for suspecting that many of the smaller of these birds largely availed themselves of the rigging of ships in the course of this passage, overlooking the fact that the hours lost by the birds during such rests only prolong the time which they have to pass without nourishment. The same argument might be urged with equal force in the case of all swimming birds belonging to the Anatidæ which might purpose to interrupt their flight across the ocean, for even if we allow that all such birds are diving ducks—*i.e.*, Platypeds—(which, however, is certainly not the case), the depth of the water in mid-ocean is such as would quite preclude their search after any kind of food.

From the foregoing facts the probability of a voluntary and direct flight can hardly any longer be open to doubt. It remains for us, therefore, to establish the possibility of such a flight. The stretch of ocean between Newfoundland and the west coast of Ireland covers at least sixteen

hundred miles without any intermediate resting-place. To accomplish this distance would, at the lowest speed of flight as determined in the case of a wild bird—viz., the hooded crow—occupy about fourteen and a half hours. On the other hand, in the case of the bluethroat only nine hours would be required. Nor is there any reason for doubting that a healthy bird and a fairly good flier is capable of remaining on the wing for nine, and in extreme cases even fifteen, hours.

It is a fact that during its autumn migration the Virginian plover travels from the Hudson Bay Territory and Labrador, across Guiana and Northern Brazil, to Lower South America, or three thousand two hundred geographical miles.

It has been further observed that in the course of their normal passage these birds neither resort to Bermuda nor to the Antilles for resting purposes, but fly across without alighting, and the only interruption of the journey is when forced by sudden and violent storms, in which case countless numbers of them seek shelter on one or other of these aforementioned islands. Observation has also revealed the fact that they travel in a southerly direction, some six hundred miles east of Bermuda, for whole days and nights, in dense flocks, succeeding each other without interruption or intermission, and numbering from a hundred to a thousand head. These flocks, it is averred on the best authority, proceeding from Labrador to Northern Brazil, meet nowhere with any resting-place in the course of their long migratory flight across the ocean, and are consequently obliged to perform this long stretch of 3,200 miles without a stoppage. They thus accomplish double the distance of 1,600 miles from Newfoundland to Ireland, and, consequently, remove every doubt as regards the possibility of the latter achievement.

It will perhaps occur to the reader that it is possible some of these birds would become exhausted before reaching land, and thus perish. It is known, however, that such land-birds as thrushes, buntings, finches, and the like

are able, in case of exhaustion, to take rest for a short time on the surface of the water—even if the waves are boisterous—and are able afterwards to continue their journey. The ways and means provided by Nature are inexhaustible, and, despite the minutest and most unflagging energy of the observer, there are doubtless channels, at present unknown to mankind, through which many species of birds—the destination of which is not at present known—find their way to their natural haunts. Such birds as the cuckoo, bird of paradise, &c., have in all ages been of remarkable interest to those who devote their lives to “find out God in the natural world.”

The destination of migratory birds has always been a subject of much interest to naturalists, and with a view to obtaining definite information upon the subject a large number of these birds were captured some two years ago by naturalists in Prussia, and a light metal ring, bearing a number and the date, was fastened to one foot of the bird, which was then set at liberty.

One of these birds—a lake fowl, bearing the date of July 26, 1907—was shot in El Bahira, Tunis, and a stork, dated July 5, 1907, was killed at Fort Jameson, Rhodesia, far beyond the Equator. It has long been known that the house stork winters in great numbers in Egypt, and that they have often been seen in Central Africa and German East Africa; but it is quite a new discovery that they should fly so far as from North Germany to South Africa.

Another authority says:—

“In the feathered world migration plays a most important part in the life of each little songster of wood and field. We know the why and the wherefore of the autumn or southern flight; it is entirely a matter of food supply. As for the northern or spring flight we can assume no logical reason. Why the birds should desert a land of plenty and attempt a journey often thousands of miles in extent, often reaching their summer homes before the snow and ice of winter have released their hold on

earth and tree, is at present a mystery, and perhaps ever will be."

The query as to the causes of the northern or spring exodus has prompted me to make an effort to explain, at least in some measure, those laws which govern migrations, not only of birds, but of certain of our mammals as well. It is a subject of which, so far as I am informed, but very little of an explanatory character has been written. Anything which may here be advanced shall be of a tentative nature. The basis of my explanations will be the recent theory of Dr. Marsden Manson, as stated in his "Evolution of Climates."

This theory has been accepted by many of the advanced scientists of to-day throughout the world. Professor Schaberle, formerly of the University of Michigan, has recently announced that Dr. Manson's theory may be considered as proven. Furthermore, the work of the United States Astro-Physical Observatory, as may be seen in the recently issued report, is favourable to the same conclusion as that reached by Prof. Schaberle.

This is not the place to state even briefly the principles of Dr. Manson's theory. I may say, however, that it makes clear and logical the various climates which have ruled upon the surface of this globe since life began, and that it has made adherents in the ranks of science from its announcement. Physicists, geologists, and astronomers, these have accepted the theory because of that unity and simplicity which distinguishes it from the many complicated and laboured dissertations on the subject which crowd our book-shelves. I shall not say that its acceptance has been universal. That could not be. There are too many who "do not wish to be disturbed" even in the ranks of science to permit such a result. The majority, however, of those who approach the subject in a fair, unprejudiced manner are accepting Dr. Manson's conclusions.

Almost without exception, however, scientists are agreed that previous to the period termed the glacial or ice age, climates were non-zonal—that is, that they were

of the same general temperature everywhere from pole to pole. First, that there was an epoch of torrid heat followed by one of tropical heat and succeeded by one of temperate heat, which gradually passed into one of excessive cold, during which period the higher lands were snow-covered. From these regions descended those immense glaciers, many reaching the sea level. Since this ice age climates have become zonal—a condition which seems to us most natural, because man remembers naught to the contrary.

The geological record shows us, however, that everywhere from pole to pole the same life existed during all the periods before the latter part of the temperate tertiary epoch. This implies that the ranges of all the various species were then vastly wider. Fossil sequoias and poplars found in the Arctic complete families mostly found on the Pacific coast.

Aside from these differences of temperature resulting from elevation ("land masses were thrust up above the then existing snow line, such snow line being independent of latitude"), there were, in the nature of things, few reasons for migrations of either fauna or flora. The first wanderings would have been due to these causes, and were undoubtedly as limited as these causes.

When finally the gradual transition from earth-heat control to sun-heat control had taken place, and the ice age began, these wanderings to and fro become systematic and periodical. The stronger and more active individuals pushed further on than their fellows, or they climbed up further on the mountain sides, thereby forming a class apart. They mated and founded new varieties. This process of natural selection continued for many thousands of years. The fur-bearing animals were in time produced, and as their protective coverings increased in warmth these extended their search for such conditions of temperature or of food supply as their well-being demanded.

So here we have in its earliest and simplest form the origin of the migratory movements of animals which have developed to such an extent in this day under the present

zonal distribution of climates. Birds and beasts travel thousands or hundreds of miles at the oncoming of spring or fall.

During all the latter part of the long tertiary period the process of mountain building or subsidence was changing the face of Nature. The fauna which had previously enjoyed so wide a range of equable temperature and a general food supply discovered that those ranges had been restricted in certain directions, while perhaps they had become more extended in others. The land bridges which had previously given them passage had sunk beneath the encroaching waters. Mountain ranges had reared their heads into the clouds and were snow-covered, forming impassable barriers in the paths of certain species. The true migration began to take form, keeping pace with the constantly changing climatic conditions, and in general terms they may be said to have begun with the ice age.

The direct burning rays of the sun near the Equator were the whips which drove onward to a more temperate region both birds and beasts. The increase of cold and the curtailment of their food supply drove them back again. The sheep and goat families accomplished their migrations in altitude and became specialised, remaining there to-day. Certain of the largest birds followed their example. Others of the feathered tribe, needing no land bridges, scorning even the mountain barriers, "took to themselves the wings of the morning and fled to the uttermost parts of the earth."

Food supply was not the only cause for these flights, but comfort and well-being, and after the passing of ages the newly acquired habit of life. They were unconsciously striving for the continuance of the former level temperature condition which had been, during millions on millions of generations, the whole life history of their species. Many varieties, however, failed to pass this extreme test of their powers.

When the ice age reached its maximum of cold and the glacier front had crept far down the Mississippi valley,

when the tops of the Rocky Mountains and the Mexican and Central American Cordilleras were capped with snow and ice, glaciers streaming far down their sides towards the sea, several species found their retreat cut off either by sea or ice. It is my belief that at this time and for this cause our American horses and camels and elephants perished. Their remains are found in vast beds in the warmest parts of the United States, bordering on the Gulf of Mexico. They had reached an impassable barrier, and not being fitted (specialised) they inevitably perished. A different geographical formation in Asia enabled the same creatures to make good their escape to warmer regions.

As there was a minimum and there will be a maximum to the ice age, so there has been a minimum and there will be a maximum to migrations. The ice fronts of the polar regions must be the limits of the feathered tribes. Mammalian life will find its migratory limit far short of those points.

In common with other species there is little doubt that earliest man himself was of a migratory habit. The human family was put to the same test as others, and came out of it triumphant. The obstacles which he was forced to cope with resulted in his great mental development that placed him far in the van in this struggle for existence. He invented clothing, made better dwellings, discovered the uses of fire, and became a domesticator of the wild animals, or, taking lessons from some others, stored away food for the inclement season. Thus the most improved race abandoned migration, and a great advance on civilisation was accomplished.

In answer to Mr. Gregor's question as to the "logical reason" of the spring migration, I conclude that this characteristic of certain species dates from the pleistocene era of the tertiary period and has two causes—food supply and comfort.

Of the first category the examples are numerous and present in everybody's mind. As to the second, a forcible case would be that of the caribou of Newfoundland, which

seeks a temperature more suitable to their heavy body, covering three hundred miles to the north of their winter home, the most northerly point, in fact, which it is in their power to reach, further progress being cut off by the straits of Belle Isle. Here they pass the summer months in comparative comfort. There is no lack of provender in the southern land which they abandoned. The barrens are covered with the white moss which forms their principal nourishment, but the heat of their thick matted hair becomes too oppressive to be borne.

This is undoubtedly also the case with our geese and ducks and of all those varieties which greet us in the spring and fall in this half-way house of their passage.

We thus may reach the conclusion that, beginning with the first modifications of climate, perhaps at the commencement of the pleistocene era, the various forms of life being suited to a uniform environment, sought in their wanderings to and fro, the continuance of those conditions.

These movements becoming more necessary as the climatic changes became more marked, regular migratory passages became systematised and further extended as the requirements have demanded.

The Power of Flight Possessed by Birds.

MOST people are familiar with the apologue of Plato, wherein a representation is given of the qualities best adapted to the modes of life of the animal creation: "To some he gave wings, to show them that their safety is in the air."

There is a great similarity between the performance of the winged tribe and the fishes in the sea, save that the bird is heavier in comparison with the air than is the fish in comparison with the water. At first sight it might be thought impossible for so huge an animal as the Ostend whale, weighing four hundred and ninety thousand pounds, to swim in the sea, considering that its body, so far as the bones and muscles are concerned, must be considerably heavier than water; yet, by a singular contrivance, it is at once buoyed up in the sea and rendered so much lighter than water that it floats on the surface when dead. This is caused by an enormous layer of an oily substance called blubber, immediately under the skin. It is said that in this particular whale the weight of blubber was one-twelfth of the whole body, measuring four thousand gallons; hence the extreme difficulty experienced in diving.

The contrivance for rendering birds buoyant in the air is totally different, and the celebrated Harvey is reputed to have been the happy discoverer. Air in considerable volume is introduced into the body, though it is not, as in fishes, contained in one cavity, but is distributed amongst numerous cells in various parts of the body.

The lungs, compared with those of quadrupeds, are rather small, but the air-cells with which they communicate

occupy a considerable space of the chest and belly. These cells are much divided by partitions, furnished, as has been observed in large birds, with muscular fibres, supposed to be employed in sending the air back to the lungs, as is done by the diaphragm in other animals, which is wanting in birds. This is no doubt the reason why birds appear to pant so much in breathing, a much greater portion of the body being always put in motion than in quadrupeds. Besides these air-cells there are others situated in the bones themselves, particularly the larger bones, both those which are cylindrical and those which are broad and angular. It is not a little remarkable that all these bones in birds are destitute of marrow—at least, in the middle.

“The air-bones in young birds” are described as “filled with marrow, which becomes gradually absorbed to make room for the admission of air. This gradual expansion of the air-cells and absorption of the marrow can nowhere be observed so well as in the young tame geese when killed in different periods of autumn and winter. The limits to the air-cells may be clearly seen from without by the transparency of the bony walls.

“From week to week the air-cells increase in size, till, towards the close of the season, the air-bones become transparent. Towards the close of the summer and beginning of autumn, although in external appearance the young goose resembles the parent, no trace of air-cells can be discovered in the bones, the interior of the bones being then filled with marrow. About the fifth or sixth month the marrow begins to disappear. Not only the bones but the quills of the feathers also make a part of this contrivance. These, while growing, are filled with an organised pulp, but as soon as they arrive at their full growth this pulp being absorbed renders them light, and the lightness is increased by air from the atmosphere being introduced into their cavity through a small opening at the termination of the furrow where the quill or barrel ends and the plumelets of the feather begin. The existence of these cells can be shown upon any bird by simply

blowing with a little force into the windpipe, by which means the belly may be blown up to a considerable size, a circumstance which would not occur in other animals."

Some remarks by Sir Charles Bell on the subject of buoyancy are well worth reproducing. "First," he says, "it is necessary that birds, as they are buoyed in the air, be specifically lighter; secondly, the circumference of their thorax must be extended and the motions of their ribs limited, that the muscles of the wings may have sufficient space and firmness for their attachment. Both these objects are attained by a modification of the apparatus of breathing. The lungs are highly vascular and spongy, but they are not distended with air.

"The weight of the body being a necessary concomitant of muscular strength, we see why birds, by reason of their lightness, as well as by the conformation of their skeleton, walk badly. And, on the other hand, in observing how this lightness is adapted for flight, it is remarkable how small an addition to their body will prevent them rising on the wing.

"It is interesting to notice the relations of great functions in the animal economy. Birds are oviparous, because they never could have risen on the wing had they been viviparous. If the full stomach of a carnivorous bird retard its flight, we perceive that it could not have carried its young. The light body, the quill feathers, the bill, and the laying of eggs are all necessarily connected.

"As everyone must have observed, the breastbone of birds extends the whole length of the body, and, owing to this extension, a lesser degree of motion suffices for respiration; so that a greater surface, necessary for the lodgment and attachment of the muscles of the wings, is obtained, whilst that surface is less disturbed by the action of breathing, and is more steady. The vertebræ of the back being fixed in birds, and the pelvis reaching high, there is no motion in the body; indeed, if there were it would be interrupted by the sternum. We cannot but admire, therefore, the composition of the neck and head,

and how the extension of the vertebræ and the length and pliability of the neck, whilst they give to the bill the office of a hand, become a substitution for the loss of motion in the body, by balancing the whole, as in standing, running, or flying. Is it not curious to observe how the whole skeleton is adapted to this one object, the power of the wings?"

If it be true that birds, when migrating, require a wind that blows against them, it implies an extraordinary power as well as continuance of muscular exertion. We see how Nature completes her work when the intention is that the animal shall rise buoyant and powerful in the air. The whole texture of the frame is altered and made light, in a manner consistent with strength. We see also how the mechanism of the anterior extremity is changed, and the muscles of the trunk altered directly. In the ingenious attempts which have been made to devise wings to enable men to fly in the air, it has rarely been taken into account that the muscles of the most powerful arm are proportionately slender and weak when compared with the wing muscles of birds.

Even if artificial wings sufficiently efficient could be contrived, the arms would be too feeble to wield them, considering also that there are no air-cells distributed through the human body as in birds to diminish its specific gravity by inflation. It may prove interesting to many of my readers to give a few details respecting these muscles of flight in birds, and we cannot follow a better guide than the late M. Chabrier, who made the flight both of birds and insects his particular study for nearly half a century, and published the result of his earlier observations in a considerable volume.

"If each muscle of flight," says he, "were to contract individually and independently of the rest, it would only put in motion the most movable parts of the body with which it is specially connected; there would be no reaction. This assertion is true in all respects, as, for example, in the depression of the wings during flight, the resistance or

the contraction of the middle pectorals and their congeners is absolutely necessary, since without it the wings would fall by their own weight, and the action of the great pectorals would be useless. Besides, in the depression of the wings, the fixed point of the middle pectorals, where the respective tendons attach themselves to the humerus, being removed, the sudden contraction of these pectorals must necessarily facilitate the ascension of the trunk until the humerus is stopped by the cessation of action in the great pectorals. It may easily be conceived why the projecting muscles of the trunk and the depression of the wings are stronger than the elevators; it is because the former cause the trunk to start, and by this means depress the wings, notwithstanding the resistance of the latter. These, being unable to prevent the humerus from descending, become fixed there, and draw up the trunk, thus assisting the action of the great pectorals, and also participating in projecting the trunk both forwards and above.

“Thus, that the bird may raise and direct itself in the air, all the muscles must contract themselves in the following manner:—The clavicle and the omoplate being fixed by the trapezium, the rhomboid, the upper part of the great dorsal, the costo-scapular, and the short clavicular, and the wing being partly unfolded, brought forward, and raised by the action of the middle pectoral of the internal sub-clavian, the elevators of the humerus, of the coracobrachial, and of the extensors of the anterior membrane of the wing, the bird springs into the air, completely expanding its wings. At the same time, the great pectorals, the primary agents of the wings, of which the point is fixed in the humerus by the insertion of their respective tendons, contract suddenly, and, in consequence of the resistance which the air opposes to the movement of the wings, carry all their power to the sternum. By this intervention they cause the trunk to rise, and the wings, whose immediate depression is resisted by the atmospheric air, as we have just said, are nevertheless depressed by these indirect means.

“While all this is performed with extreme quickness, several muscles of the wings, besides, among others, the extensors of the tail, strive to extend the wing; but, as the resistance of the air on the extremities of the plumage is very great, and this fluid opposing all rapid movement on their part, these muscles then direct their power against the sides of the trunk. Taking, then, their position on the bone of the wing, on the external side of the wing, and acting by their upper extremity, they extend the main wing-bone over the fore wing-bone, and, as this action and that of the great pectorals occur at the same instant and in concert on each side of the trunk, the latter is forced up in a middle direction.

“Thus the combination of these various efforts impart to the trunk a force of projecting forward and ascending, by which it is propelled with the wings. This projection is evidently similar to the leap of other animals. The great pectorals then relax, and the wings immediately reascend, partly by the reaction of the air on their lower surface and the descent of trunk, and partly by the action of the middle pectorals and their congeners, whose contraction, so to speak, continues during the flight.

“After having darted forward, the bird remains for an instant unsupported by the air; this fluid then, by its reaction, repels and tends to raise it still higher than the leap alone could have done, and afterwards prevents it again falling as low as the point of departure. The ascension of the trunk is doubtless favoured by the internal air, which insinuates itself into every part of the animal, and which the latter has the faculty of retaining. The air, which is perhaps a light gas, being dilated and rarified by great heat, not only is its specific gravity probably diminished, but it must also contribute to diminish that of the air by inflating it and supplying all vacancies during the flight.

“If the bird which descends precipitately fears to hurt itself on approaching the earth, it opens its wings, and its tail, and takes several little leaps, which, diminishing

the rapidity of the descent, permit it to alight gently on the earth. It is by the assistance of the tail that certain birds are enabled to descend with precipitation from a great height. By spreading the tail and closing the wings they cause the action of the air to predominate on the hind part of the body, which directs the fore part downwards and leaves it entirely to the influence of gravitation. The tail may strengthen the action of the wing by moving towards the same side."

Though it is obvious that birds could not fly without wings, yet the peculiar mechanism of the process is not, as it were, generally understood. It is no uncommon thing to see a goose, while walking on a common, spread out its wings to their full extent, and begin to flap them about with great violence, and yet the bird is not thereby moved an inch from the ground—a circumstance that, without inquiry into the cause, seems contrary to what might have been anticipated.

By observing the difference between this ground-flying—if I may call it so—of the goose and the actual rising of a pheasant, for example, into the air, one may arrive at the reason why the goose does not, while the pheasant does, ascend. The goose, it may be remarked, keeps her wings spread both in the upward and downward motion, and, consequently, the resistance of the air in the first case will press her body downwards rather than upwards; while, as her evident intention is not to rise above the ground, she forcibly expels the air from her air-cells, as may be inferred from the screaming always uttered on those occasions, and caused, one has reason to believe, by the forcible expulsion of the air. Her body is thus rendered specifically heavier, and, consequently, resists the upward impulse given by the downward motion of the wings. The pheasant, on the other hand, instead of expelling the air, takes a deep inspiration, increasing the size of the body as much as possible, inflating at the same time the wing feathers and bulging them outwards without separating their tips from the sides. While taking deep

inspirations he may be observed also several times rising on tiptoe and puffing out and balancing his body, to feel whether he has thrown enough air into the bones and feathers to float him along. He then crouches back in order to give additional force to his spring, and forthwith leaps up into the air, at the same time rapidly raising his wings from the sides, but keeping the individual feathers close together, like a folded fan, which he takes care not to open till he begins to bring them down. For this purpose he spreads them out to their utmost extent, and then, striking the air with all his force, its resistance pushes him upwards, and he bounds aloft towards his tree-perch, or wherever else he wishes to go.

The same series of motions—first raising the folded wings and then forcibly bringing down the spread wings—must be incessantly repeated during the flight of every bird, in the same manner as a swimmer, by pressing the water downwards with his spread hands, keeps himself afloat, and by directing the motion obliquely backwards is thereby pushed forward. It may also be remarked that the swimmer raises his hands before renewing the stroke with the fingers closed, slanting, in a similar way to the bird raising its folded wings, so as to diminish the surface opposed to the resisting medium.

When birds fly horizontally, their motion is not in a straight line, but obliquely upwards, and they allow the body to come down to a lower level before a second stroke is made by the wings, so that they move in a succession of curves. To ascend obliquely, the wings must repeat their strokes upon the air in quick succession, and in descending obliquely these actions are proportionally slower.

In birds of prey the form of the wings is very oblique, so that they cannot rise in the air perpendicularly unless they fly against the wind. They have, however, a greater power of horizontal motion than other birds, because the extreme parts of the wings are long, and the ends of the feathers lap over each other, which opposes a uniform resistance to the air, while in other birds the air passes

through between the feathers, which lessens the power of keeping the wing oblique. To enable themselves to turn to the right or left, they move one wing more rapidly than the other. This is attended with difficulty when the flight is rapid; they therefore make a large sweep before they can turn round.

Comparative Energy in Birds.

THE members of the feathered tribe, especially small birds, appear to be the most restless of all animals—a circumstance which might lead one to conclude that animals are restless in proportion to their diminutive size, were this not in opposition to many other facts.

The bee, for example, is equally noted for industry and bustling activity with the ant, which is not one-fourth of its size; nay, the *Large Wood Ant* (*Formica rufa*) is greatly more active than the very small *Black Ant* (*Ponera contracta*).

The Gnat (*Culex*) again, a comparatively small insect, seems to repose during the greater part of its existence, remaining fixed in one spot for whole days together, and only moving about for an hour or two in the evening; while there may be observed on the same wall a still smaller insect (*Neiedes elegans*), seldom moving quicker than the minute-hand of a clock, the motion of which, by interrupted jerks, much resembles that of the insect.

There cannot, however, be a doubt that the wren and the tom-tit are more active and restless than the bustard, the ostrich, or even than the eagle; and the activity, moreover, of such small birds is not, like that of the gnat, confined to an hour or two, but continues almost uninterruptedly during sunlight, sleep being, it would appear, less necessary than it is to larger animals to restore vigour after exertions so long continued.

Motion of some kind indeed seems as indispensable to life as food and air; and even the motions of animals, which may be primarily accounted for by referring to their exertions to procure subsistence, and shelter, and the like, must always, in a secondary point of view, give them beneficial exercise.

Faculties of Vision in Birds.

THE great power of flight possessed by birds is seconded by as great a power of vision, which enables them, as they travel at so swift a rate, to inspect the country below, discover their food with facility, and thus attain the object for which their journey has been undertaken.

This has been abundantly proved to be the case, for the winged species have been observed, when passing over a sterile part of the country, or one scantily furnished with food suited to them, to keep high in the air, flying with an extended front, so as to enable them to survey hundreds of acres at once. On the contrary, when the land is richly covered with food, or the trees are abundantly hung with mast, they fly low, in order to discover the part most plentifully supplied. Their body is of an elongated oval form, steered by a long, well-plumed tail, and propelled by well-set wings, the muscles of which are very large and powerful for the size of the bird.

As soon as the pigeons, for example, discover a sufficiency of food to entice them to alight, they fly round in circles, reviewing the country below. During their evolutions on such occasions, the dense mass which they form exhibits a beautiful appearance as it changes its direction, now displaying a glistening sheet of azure, when the backs of the birds come simultaneously into view, and anon suddenly presenting a mass of rich deep purple. They then pass lower over the woods, and for a moment are lost among the foliage, but again emerge, and are seen gliding aloft.

The return of the carrier pigeon from such distances to

its home is, one thinks, most plausibly accounted for by its mode of flying in circles; but that there may be some other manner in which it is directed is not improbable from what takes place among quadrupeds.

Instances, for example, are not uncommon of cats having returned of their own accord to the place from which they have been carried, though at the distance of many miles, and even across rivers, where they could not possibly have had any knowledge either of the road or of the direction that would lead them to it. "The nature of the beast" is to love the place of her breeding; neither will she tarry in any strange place, although carried far, being never willing to forsake the house for the love of any man, and most contrary to the nature of a dog, who will travel abroad with his master; but, although their masters forsake their houses, yet will not these beasts (cats) bear them company, and, being carried forth in close baskets or sacks, they will return again. A cat has been known to travel from London to Chatham, in Kent, a distance of thirty miles, and most persons can relate similar incidents. But then dogs do the same.

A mastiff, which a gentleman had brought up in India from two months old, accompanied him and a friend from Pondicherry to Bangalore, a distance of more than three hundred leagues. "Our journey," he goes on to relate, "occupied nearly three weeks, and we had to traverse numerous plains and mountains, and to ford rivers and go along several by-paths. The animal, which had certainly never been in that country before, lost us at the extreme end of our journey, and immediately returned to Pondicherry. He went directly to the house of a friend with whom I had formerly lived. Now, the difficulty is not so much to know how the dog subsisted on the road (for he was very strong and well able to procure for himself food), but how he could so well have found his way after an interval of more than a month."

A still more extraordinary instance of returning is

recorded on the authority of the late Lieutenant Alderson, of the Royal Engineers, who was personally acquainted with the facts. An ass, the property of Captain Dundas, R.N., then at Malta, was shipped on board the "Ister" frigate (Captain Forrest), bound from Gibraltar for that island. The vessel having struck on some sands off the Point de Gat, at some distance from the shore, the ass was thrown overboard to give it a chance of swimming to land—a poor one, for the sea was running so high that a boat which left the ship was lost. A few days afterwards, however, when the gates of Gibraltar were opened in the morning, the ass presented itself for admittance and proceeded to the stable of Mr. Weeks, a merchant, which he had formerly occupied, to the no small surprise of this gentleman, who imagined that, from some accident, the animal had never been shipped on board the "Ister."

On the return of the vessel to repair, the mystery was explained, and it turned out that "Valiante" (so the ass was called) had not only swam safely to shore, but, without guide, compass, or travelling map, had found his way from Point de Gat to Gibraltar, a distance of more than two hundred miles, through a mountainous and intricate country, intersected by streams, which he had never traversed before, and in so short a period that he could not have made one false turn. His not having been stopped on the road was attributed to the circumstance of his having been formerly used to whip criminals upon, which was indicated to the peasants (who have a superstitious horror of such asses) by the holes in his ears, to which the persons flogged were tied.

It would appear, from an observation of Professor Lichenstein, that birds which feed on carrion may probably resort to making circular flights, similar to the pigeon, in order to discover a carcass. He remarked, when travelling in South Africa, that if an animal chanced to die in the very midst of the most desert wilderness, in less than half an hour there was seen high in the zenith a number of minute

objects descending in spiral circles, and increasing in visible magnitude at every revolution. These were soon discovered to be a flight of vultures, which must have observed from a height, viewless to the human eye, the dropping of the animal immediately marked out for prey.

An old writer, Dr. James Johnson, mentions a fact illustrative of the same view. During the north-east monsoon, when the wind blew steadily in one point for months in succession, he observed a concourse of birds of prey from every point of the horizon hastening to a corpse that was floating down the River Ganges, and he accounted for their thus congregating and appearing suddenly from immense distances to their soaring high in the air for the purpose of looking out for food.

It is said in St. Matthew, as the received translation gives it, that, "where the carcase is, there will the eagles be gathered together," and in Job it is said, "Where the slain is, there is she." Now, it is well known that the eagle does not feed on carrion, and it has been proved by experiment that it will not touch it unless pressed by hunger (Selby). Yet Professor Paxton contends with St. Jerome that the eagle is certainly meant in the text, and quotes, after Bochart, the Arabian historian, Damir, who asserts that the eagle can discover a carcase at a distance of four hundred parasangs, with this singularity, that if he finds parts of it have been previously eaten by the osprey he will not touch the leavings of his inferior. This circumstance makes rather against Dr. Paxton's opinion, supposing the authority Damir to be good. In consequence of this apparent discrepancy between facts and the text, St. Chrysostom proposed to read "vultures" for "eagles" in the passages both in Matthew and Job (Chrysos. Hom., xlix.). Aldrovand, it would appear, has given the only judicious solution of the difficulty by referring to a very common Oriental species (*Gypactus barbatus*, Storr), which was remarked by Aristotle to be similar in form to the eagle, but had more the habits of the vulture,

Besides the nictitating membrane in the eye of birds, which is not altogether peculiar to them, there is another singular part of the organ whose use has not hitherto been clearly ascertained. It is called by the French Academicians the *Purse* (*Marsupium*) and the *Comb* (*Pecten plicatum*). It arises in the back of the eye, and, proceeding apparently through a slit in the retina, it passes obliquely into the vitreous humour, where it terminates, reaching in some species to the capsule of the lens. Numerous blood-vessels run in the folds of the membranes which compose it, and the black pigment by which it is covered suggests the idea that it is chiefly destined to absorb the rays of light when they are too strong or dazzling. If this be the fact, it may serve the eagle in good stead when gazing, if he ever does so, on the sun.

It is the manifest opinion of others that it serves to assist in producing the internal changes of the eye; but this has been opposed by Crampton, who has shown that the changes in question—at least in the ostrich and several large birds, are produced by a peculiar circular muscle in the eyeball. Buffon is of opinion that, on account of this expansion of the optic nerve, birds must have a vastly more perfect sight than other animals, embracing also a much wider range. Hence it is that a sparrow-hawk, while he hovers in the air, espies a lark sitting on a clod, though at twenty times the distance at which it could be perceived by a man or dog.

The kite, which soars to so amazing a height as to totally vanish from our sight, can yet distinguish small lizards, field-mice, and birds, and from this lofty station he selects his prey. This prodigious extent of vision is, moreover, conjoined with equal accuracy and clearness, inasmuch as the eye can dilate and contract, can be shaded or uncovered, depressed or protruded, readily assuming the precise condition adapted to the distance of an object and the quantity of light.

Had they, indeed, been formed with eyes like the mole,

incapable of seeing more than a few inches' distance, they would have been in constant danger of dashing against every intervening obstacle. "Indeed," remarks the same writer, "we may consider the celerity with which an animal moves as a just indication of the perfection of its vision. A bird, for instance, that shoots swiftly through the air must undoubtedly see better than one which slowly describes a tortuous tract. Among quadrupeds, again, the sloths have a very limited sight."

It may accordingly be inferred that birds have more precise ideas than slow-moving caterpillars of motion and its accompanying circumstances, such as those of relative velocity, extent of country, the proportional height of eminences, and the various inequalities of hill and dale, mountain and valley.

Our birds'-eye views, of which the accurate execution is so tedious and difficult, give but a very imperfect picture of the relative inequality of the surfaces which they represent, but birds can choose the proper stations, can successively traverse a field in all directions, and with one glance comprehend the whole. On the other hand, the quadruped knows only the spot where it feeds—its valley, its mountain, or its plain; but it has no conception of expanse or surface—no idea of immense distances, and no desire to push forward its excursions.

The eye of birds, it is worthy of remark, besides being peculiar in structure, is also greatly larger than in most other animals in proportion to the bulk of the head. According to a very distinguished writer, the ball of the eye in a female eagle was, at its greatest width, an inch and a half in diameter; that of the male was three times less; that of an ibis, six times; of a stork, four times larger. That of a cassowary was four times larger than its cornea, being an inch and a half in diameter, while the cornea was only three lines. The woodcock has very large, prominent eyes, but it cannot support a strong light, and sees best during twilight; and as Colonel Montagu

remarks, its eyes seem to be peculiarly calculated for collecting the faint rays of light in the darkened vales and sequestered woodlands during nocturnal excursions, thus enabling it to avoid trees and other obstacles. It is probable, indeed, that the proverbial stupidity of the bird arises from this weakness of sight. Like the owl, indeed, its motions are much more agile and lively at nightfall and dawn than at any other time; and so strong is this propensity to action at the rise or descent of the sun that woodcock when kept in a room are observed to flutter about regularly every morning and evening, while during the day they only trip on the floor without attempting to fly.

The stone-curlew differs from the last-named particularly in this, that, though its eyes are similarly prominent, its sight is very acute in the daytime. The prominence of its eyes enables it to see behind as well as before, and it is with difficulty, therefore, that it can be approached. With respect to owls, as well as night-prowling animals, the eye is unquestionably very sensitive.

Of the barred owl an experienced naturalist remarks, "Its power of sight during the day seems to be rather of an equivocal character, as I once saw one alight on the back of a cow, which it left so suddenly afterwards, when the cow moved, as to prove to me that it had mistaken the object on which it had perched for something else. At other times I have observed that the approach of the grey squirrel intimidated them, if one of these animals accidentally jumped on a branch close to them, although the owl destroys a number of them during twilight."

Wilson says of the snowy owl that "the conformation of the eye forms a curious and interesting subject to the young anatomist. The globe of the eye is immoveably fixed in its socket by a strong, elastic, hard, cartilaginous case, in the form of a truncated cone. This case, being closely covered with a skin, appears at first to be of one continued piece, but on removing the exterior membrane

it is found to be formed of no less than fifteen pieces, placed like the staves of a cask, overlapping a little at the base or narrow end, and seem as if capable of being enlarged or contracted, perhaps by the muscular membrane in which they are encased."

In nocturnal birds—it has been remarked by several writers—the eye, besides being comparatively very large, is flat (comprime) both before and behind, while the transparent cornea is placed at the end of a sort of tube formed by the bony portion of the sclerotic. The retina is consequently comparatively very large and extended, and the iris also; while the membranes, being probably more soft and delicate, are more susceptible of impressions from a small quantity of light. The nictitating membrane is also very large, and the upper eyelid, unlike other birds', is moveable.

I have adverted to the method of catching larks by means of a looking-glass, referring to the remarkable curiosity of birds as the probable cause of their being attracted to the bright glass. Whether it is on a similar principle that ravens, jays, and magpies (*Corvidæ*), are fond of bright objects we have no means of deciding. In accordance with this view, a writer on natural history says: "A looking-glass is a matter of great wonder to magpies. We once saw one placed on the ground where two were hopping about. One of them came up to it, stared at it in apparent wonder, hopped off to the other, and then both returned and spent at least ten minutes in nodding, chattering, and hopping about the glass."

Colonel Montagu tells us he was "assured by a gentleman of veracity that his butler, having missed a great many silver spoons and other articles without being able to detect the thief for some time, at last observed a tame raven with one in his mouth, and watched him to his hiding-place, where he found more than a dozen."

A similar story is told by a lady of a raven kept a few years ago at Newhaven, in Sussex—at an inn on the road

between Buxton and Ashbourne. This bird had been taught to call the poultry when they fed, and could do it very well too. One day the table had been set out for the coach passengers; the cloth was laid with the knives, and forks, spoons, mats, and bread, and in that state was left some time, the room door being shut but the window open. The raven had watched the operation very quietly, and, we may suppose, felt a strong ambition to do the like. When the coach was about arriving, and the dinner carried in, behold, the whole paraphernalia of the dinner-table had vanished! It was a moment of consternation—silver spoons, knives, forks, all gone. But what was the surprise and amusement to see, through the open window, upon a heap of rubbish in the yard, the whole array carefully set out, and the raven performing the honours of the table to a numerous party of poultry which he had summoned about him, and was very consequentially regaling with bread.

M. Antoine tells us that there is an annual mass, called the Magpie Mass, said in the Church of St. John at Greve, which arose from the following circumstance. A magpie, indulging its propensity to carry off and conceal glittering objects, took a fancy to make free with the church plate, and in consequence thereof a maid-servant was accused of the theft and delivered over to the hands of justice. The accused, according to the barbarous custom of that period, was put to the torture, and, a confession of the crime being thus extorted, the poor girl was condemned to die. Six months after the lost plate was discovered behind a mass of tiles on an old house, where a tame magpie had concealed them and continued to add to the hoard. The mass was founded on account of the innocent girl who had fallen a victim to an execrable law. This story was no doubt the origin of the well-known melodrama, "The Maid and the Magpie."

A famous naturalist author mentions that he once saw "taken out of a magpie's nest a crooked sixpence, of

which some village fair one had haply been despoiled, a tailor's thimble, two metal buttons, a small plated buckle, and three or four bits of broken crockery." At the same time he exculpates the *Jackdaw* (*Corvus monedula*), for want of proof, of a similar charge made against him.

"At country churches," he says, "where it frequents the steeple, a situation to which it is very partial, we have heard it accused of a very profane theft. At those places in the North a collection is made in a salver outside the door, and if a sixpence or a shilling finds its way among the copper donations, the jackdaw is accused of pouncing down and purloining it; but there is no proof against it."

"The *Divers* (*Colymbi*) of Louisiana," says M. Dupratz, "when they see the fire of the touch-pan, dive so nimbly that the lead cannot hit them, for which reason they are called lead-eaters."

Observers repeatedly see the same quickness of eye exemplified in the *Cormorant* (*Carbo cormoranus*) of our own seas; for, though approached with the greatest caution, and when the bird has not manifested any fear, but was skimming about on the water, the instant the powder flashed in the pan it would dive down and escape the danger.

It may be worth mentioning that animals born with perfect eyes can use them the instant they enter the world. Sir James Hall, when making experiments on hatching, observed a chicken in the act of breaking through the shell, and, just as it got out, a spider began to run along the box, when the chicken darted forward, seized, and swallowed it as adroitly as if it had been instructed by its mother.

Bird Characteristics Architecturally

THE *Stormy Petrel*, also called the Storm-swallow by the Dutch, whose great power of wing enables it to sweep over the ocean at every distance from land, and even to weather the most tempestuous winds, has a great peculiarity. With its webbed feet and light form it can actually walk upon the billows with as much ease as a sparrow can hop along a garden wall.

"It is indeed an interesting sight," says Wilson, "to observe these little birds, in a gale, coursing over the waves, down the declivities, and up the ascents of the foaming surf that threatens to burst over their heads, sweeping along the hollow troughs of the sea, as in a sheltered valley, and again mounting with the rising billow, and just above its surface, occasionally dropping their feet, which, striking the water, throw them up again with additional force, sometimes leaping, with both legs parallel, on the surface of the roughest waves for several yards at a time. Meanwhile they continue coursing from side to side of the ship's wake, making excursions far and wide to the right and to the left, now a great way ahead and now shooting astern for several hundred yards, returning again to the ship as if she were all the while stationary, though perhaps running at least ten knots an hour. But the most singular peculiarity of this bird is its faculty of standing, and even running, on the surface of the water, which it performs with apparent facility. When any greasy matter is thrown overboard these birds instantly collect around it, facing to windward, with their long wings expanded and their webbed feet patting the water. The lightness of their bodies and the action of the wind on

their wings enable them with ease to assume this position. In calm weather they perform the same manœuvre by keeping their wings just as much in action as to prevent their feet from sinking below the surface."

In days long past, happily, the mariner regarded this species of bird as the harbingers of all that is evil. They have been called "witches," "the Devil's birds," and "Mother Cary's chickens," probably from some celebrated ideal hag of that name; and their unexpected and numerous appearance in those days threw a momentary damp over the mind of the hardiest seaman.

When we inquire, by diligent research, into the unvarnished history of this ominous bird, we find that it is by no means peculiar in presaging storms, for many others of very different families are evidently endowed with an equally nice perception of a change in the atmosphere. Hence it is that, before rain, swallows are seen more eagerly hawking for flies, and ducks carefully trimming their feathers and tossing water over their backs to try whether it will run off again without wetting them. But it would be as absurd to accuse the swallows and ducks on that account of being the cause of rain as to impute a tempest to the spiteful malice of the poor petrels. Seamen ought rather to be thankful to them for the warning which their delicate feelings of aerial change enable them to give of an approaching hurricane.

"As well," says Wilson, "might they curse the midnight lighthouse that, starlike, guides them on their watery way, or the buoy that warns them of the sunken rocks below, as this harmless wanderer, whose manner informs them of the approach of the storm, and thereby enables them to prepare for it."

The petrels are nocturnal birds. When, therefore, they are seen flying about and feeding by day, the fact appears to indicate that they have been driven from their usual quarters by a storm; and hence, perhaps, arose the association of the bird with the tempest. The once popular

opinion among sailors that the petrels carry their eggs under their wings in order to hatch them is no less unfounded than the fancy of their causing storms; it is indeed physically impossible.

They have been ascertained to breed on rocky shores, in numerous communities like the bank-swallow, making their nests in the holes and cavities of the rocks above the sea, returning to feed their young only during the night with the superabundant oily food from their stomachs. The quantity of the oily matter is so considerable that in the Faroe Isles they use petrels for candles, with no other preparation than drawing a wick through the body of the birds from the mouth to the rump. While nesting they make a clattering or croaking noise, similar to frogs, which may be heard during the whole night on the shores of the Bahamas and Bermuda Islands and on the coasts of Cuba and Florida, where they abound.

Forster says they bury themselves by thousands in holes underground, where they rear their young and lodge at night; and in New Zealand the shores resound with the noise similar to the clucking of hens or the croaking of frogs, which they send forth from their concealment.

The eggs of the petrel are surprisingly large considering the diminutive size of the bird, being as fine as those of the thrush. The female lays two eggs of a dirty or dingy-white, encircled at the larger end by a ring of fine rust-coloured freckles. In many parts of the world, notably Juan Fernandez and similar Pacific islands, they occupy the rabbit burrows or scoop out similar earth channels, and in this respect they imitate the sea-parrot or puffin.

The *Puffin* (*Fratercula arctica*) is one of the best known excavators. It is remarkable for the singular form of its bill, which exactly resembles two very short blades of a knife applied one against the other by the edge, so as to form a sort of triangle, but longer than it is broad, and channelled transversely with three or four little furrows near the point. From the position of the feet, also, which

are thrown so far back that it stands almost upright, it has more the air of a small kangaroo than of a bird. They have this character in common with all the true diving ducks.

In the breeding season, numerous troops of them visit several places on our coast, particularly the small island of Priestholm, near Anglesey, which might well be called puffin-land, as the whole surface appears literally covered with them. Soon after their arrival in May they prepare for breeding, and it is said the male, contrary to the usual economy of birds, undertakes the hardest part of the labour. He begins by scraping up a hole in the sand not far from the shore, and, after having got to some depth, he throws himself on his back, and, with his powerful bill as a digger and his broad feet to remove the rubbish, he excavates a burrow with several windings and turnings from eight to ten feet deep. He prefers, when he can find a stone, to dig under it, in order that his retreat may be more securely fortified. Whilst thus employed, the birds are so intent upon their work that they are easily caught by the hand.

This bird, like others which burrow in similar localities, is accused of dispossessing the rabbits, and even of killing and devouring their young. But it would require more authentic testimony than the majority of naturalists have met with to convince one of this alleged robbery, the only apparent evidence being that they are found burrowing along with rabbits in similar holes. We very commonly find, in the same sandbank, numerous perforations crowded into a small space, the work of various species of solitary bees, side by side and intermingled with those of *Sand-wasps* (*Sphecidae*); but no naturalist who has accurately observed the proceedings of these insects would conclude that they were mutual robbers, merely because he observed them going in and out of contiguous holes.

In some instances it is certain that the puffin must form its own burrows.

"In one part of the island," (Akaroe), says Professor Hooker, "where there is a considerable quantity of rich loose mould, the puffins breed in vast numbers, forming holes three feet below the surface resembling rabbit burrows, at the bottom of which they lay a single white egg, about the size of that of the lapwing, upon the bare earth. Our people dug out about twenty of these birds, which they afterwards assured me made an excellent sea-pie." If the puffin, however, is really a robber of rabbit burrows, it is too formidably armed to allow of retaliation with impunity, and few birds or beasts venture to attack it in its retreat.

The Penguin (Aptenodytes patachonica) is still more like a kangaroo than the last-named, on account of its having no quill feathers in its wings, or, rather, arms; while it is so large that it has, as well as the albatross, obtained from our sailors the name of the Cape sheep. But, though its bill, which is long and narrow, seems less strong for digging than that of the puffin, it contrives to form extensive burrows in the desolate islands which it frequents. Sir Francis Drake says the French called them toads, from their creeping into holes underground; and Van Noort tells us that they make the holes themselves, as the rabbits do. They select for nestling a sandy plain or down, where they usually congregate in such numbers as everywhere to undermine the ground, so that in walking it is not unusual to sink up to the knees; but, if the penguin chances to be at home, she revenges herself upon the passenger who has destroyed her roof by fastening upon his legs and biting him severely.

Another species of these birds, called the *Cape Penguin (Aptenodytes demersa)*, smaller than the preceding, makes its nest among brambles, scraping in the sand and forming a hole, in which it lurks so closely that in passing along it is not readily perceived, though the traveller soon receives no very friendly notice to quit the premises by the penguin biting his legs with her formidable bill. They are also known to nestle on the islets along the southern coasts of

Africa; and, what is remarkable, they were observed in one instance to prefer a raised knoll, though it was half a mile from the sea.

Another bird with an architectural bent is the *Burrowing Owl* (*Strix cunicularia*), a singular bird, found in some of the warmer districts of America. This bird, too, is accused of availing itself of the labours of others with as much injustice as it appears the puffin is subjected to. Fouillee and Molina, the original describers, say that the owl found in Chili digs a hole in the ground for its nest.

"The evidence for this fact," says Hill, "is far from being satisfactory, for it does not follow that a bird which has been found in a hole underground either dug that subterranean habitation or constantly resided there."

The evidence upon the subject is certainly contradictory, and can only be reconciled by considering that the observations of travellers apply to distinct species of these birds. Vieillot tells us that the owl he observed in St. Domingo digs itself a burrow two feet deep, at the bottom of which its eggs are deposited on a bed of moss, stalks of herbs, and dried roots, and that the young, when only covered with down, frequently ascend to the entrance to enjoy the warmth of the sun, but, being very fearful of danger, they quickly hide themselves in the burrow the instant they are approached. Azara, on the other hand, says that the diurnal owl, which he calls *Suinda*, never enters woods or perches upon trees, but exclusively haunts the open country where game abounds, making its nest and concealing itself in the holes or kennels of the armadillos, which are not very deep, but well lined with hay or straw.

Peculiarities of Birds.

THE *Herring Gull*, the old ones of this species usually being called the summer gull and the youthful members the grey gull, is usually well represented on most of our coastings. During the fishing seasons in spring and autumn, when the fish offal supplies them with an abundance of welcome fare, hundreds of them assemble near the shore; in the early summer months by far the larger majority of these are old individuals in snow-white plumage.

At such times the scene presented to the eye of an observer is truly wonderful. They spread themselves in a motley crowd, at all heights above the sea up to two or three hundred feet; they soar about confusedly among each other, crossing each other's paths, ascending and descending, amid frequent utterance of their loud, clear-sounding "kliau, kliau, kliau!"

Still more beautiful is the scene when, momentarily disturbed by a boat, the whole flock rises in circling flight above the elevated sandhill or cliff, and there, in the calm, clear atmosphere, soars about on motionless expanded wings, neither lowering nor ascending, but performing revolutions in beautiful curves and circles, until the object (boat probably) having disappeared, the birds once more return to their previous occupations.

In my previous notes I have dealt with the altitude of the migration flight, and I have found that these gulls, and in fact the majority of birds, are endowed with qualities and capacities by means of which they are enabled, according to their needs, to neutralise and overcome the

general and established laws of gravity, without making use of the mechanical powers of their wings, or being supported by atmospheric currents. Not only are these gulls able to soar in a calm atmosphere in a direction straight before them, or sideways, on outspread wings, but, like the buzzard, they can also, in a manner similar to theirs, soar upwards to any desired altitude.

The gulls are able to perform their soaring movements on the same plane in all phases of the weather, during the most violent storm as well as in a perfect calm, pressing forwards or athwartwise at the most diversified rates of velocity; now skimming along with the fleetness of an arrow, then merely gliding, as it were, at the slowest pace imaginable.

One is almost led to the belief that these birds must have at their command some unknown means or mechanism which prevents their sinking; for neither is the surface-area of their wings large enough, nor are these organs sufficiently concave in form, to allow of their supporting the bird after the manner of a parachute.

It has been conjectured that this upward soaring flight of birds is accomplished by vibratory movements of the separate feathers. But this theory has been seriously discounted by observations carried out by eminent authorities on bird-life.

During a heavy storm these large gulls soar about at heights of at least a thousand feet with the same demeanour as in the most perfect calm. Direction of wind, contrary or otherwise, makes no difference. At one time they may be seen soaring quite slowly to and fro, at another dashing with unusual haste towards some object sighted in the distance; very frequently they will remain poised motionless at one spot apparently for the space of minutes.

Herring gulls, if reared quite young, become extraordinarily tame.

Their nesting quarters extend from Scandinavia westwards to the Farne Islands, and onward to the central parts

of North America, and oftentimes extend their range to the Azores and Canary Islands.

II.

Birds of prey—though not calculated to make a pleasing impression on the mind of the observer—are objects of utility and interest. They free the countries where they dwell from an immense number of noxious creatures, such as serpents, and some of them at least clear away the carrion. Singing birds devour an innumerable multitude of caterpillars and insects.

Birds in proportion to their size require much more food than mammiferous animals, and thus become much more useful. Many species of birds serve mankind for food; and their eggs are both nutritious and pleasant. Their plumage serves partly for warmth and partly for ornament. Many delight us with the exquisite modulation of their notes; nor is our admiration less excited by the skill displayed in the construction of their nests.

The migratory habits of various birds are also highly deserving of our notice. Some are only partially migratory, removing from one district or locality to another, as from the borders of the sea into the interior of the country, or from the mountains to the plains or *vice-versa*. Others remove to a distant country, like the stork, which is found in Holland in the summer, but makes its winter abode in Egypt and Barbary. The swallow tribe quit this country and other parts of Europe in the autumn, and pass in large troops over to Africa; they arrive in Senegal early in October.

But many birds, which among us are birds of passage, are stationary in the milder climate of Palestine, and never leave the place of their birth, unless for a very short time. The number of species of birds is much greater than that

of quadrupeds; many of them also are very long lived. The swan is said to attain the age of a hundred years.

The organs of breathing in birds are admirably constructed for the purpose of enabling them to fly with greater ease. The air passes through their lungs into air-cells, which either surround or are joined to the heart and liver, and other internal parts; there are even air-cells in the bones, which are supplied in the same way. In the *Wild Swan* (*Cygnus ferus*) the wind-pipe, after passing down the long neck of the bird, is curiously coiled up within the breast-bone for the same purpose. Naturalists state that in the *Tame Swan* (*Cygnus olor*) the trachea does not make this convolution.

There is a closer resemblance than appears at first sight between the wings of birds and the fore-legs of quadrupeds. The joints are similar, and in both the upper part of the limb consist of a single bone, and the lower of two.

The brain in birds is larger in proportion than that of quadrupeds. The eyes are so large that there is no brain between them, but only a thin plate of the skull. The organ of smell lies at the root of the beak. The tongue in most birds is gristly, and not formed for any delicacy of taste. In the parrot it is thick and fleshy, and also in the duck and goose. They have no outward ear like quadrupeds, but an opening covered with feathers.

Birds of prey are known by their bent beak and crooked talons, very powerful weapons, which they employ to take other birds, and even weak quadrupeds and reptiles; they have all four toes; the nail of the hind toe and that of the internal toe are the strongest. They form two families, the diurnal and the nocturnal. The former have a quick and piercing sight; a membrane called the cere covers the base of the beak, in which are placed the nostrils; they have three toes before and one behind; the two outward toes are almost always united at their base by a short membrane; the plumage is close; the feathers are strong, and the flight powerful.



[Photo—S. H. Smith, York.

A GROUP OF CLIFF CLIMBERS.



[Photo—S. H. Smith, York.

A CLIFF CLIMBER'S SHELTER.

Birds in Winter.

ONE of the most interesting features in bird-life in chilly winter days is the disposition of certain species to live together in companies. The rooks, the jackdaws, the lapwings, the starlings, and others are noteworthy for this peculiarity, the last-named especially so. Those who take any interest at all in the countryside cannot fail to have observed how very obtrusive these sombre feathered folk are at the colder periods of the year.

Starlings, moreover, have increased in numbers more rapidly than any other bird, unless it be the sparrow. People who are by no means in the "sere and yellow leaf" can remember when the starling's nest was a novelty; now the birds are to be found everywhere, and they behave in a manner quite unlike their neighbours, presenting a subject of interest and study to which the ornithologist has given not a little attention. From this it need not be assumed that the starling is wiser than his congeners, though if there are degrees of intelligence among birds this familiar specimen will not suffer by comparison, his movements often suggesting method and purpose. To understand and explain why the starling acts as he does is as difficult as are bird problems generally.

The average town dweller need not go far afield to see bird life in all its varied activities, and the remark applies particularly to the starling, which delights in human companionship so obviously that he haunts our domestic roofs and chimney-stacks when no other bird, except the sparrow, will deign to come near.

In the suburbs the starling is nearly always conspicuous, for the reason, no doubt, that he is reluctant to leave the locality in which he may have been bred. Then the encouragement given to tree life nowadays is an inducement to the starling, as to other birds, to continue to abide in umbrageous Suburbia. At a given period, Leazes Park, Newcastle, is one of the largest starling-roosting retreats I have ever come across. It has been thus used by the birds for more years than one cares to count, and every year the demand for space grows more clamant. Here birds of many varieties are found all the year round, but in autumn this delightful retreat for a time becomes in a special sense the abode of the starling. There is hardly a tree or branch that is not requisitioned for the nocturnal perch. The starlings use the place for roosting only. The noisy roosters prefer other feeding quarters. Birds in fact seldom feed and roost in the same place, many of them flying miles morning and night between the two resorts.

There is only one period of the year when the enclosure is absolutely free of starlings, and that is the nesting season; but fairly large flocks of birds have been known to remain throughout the summer, hovering about the locality restlessly, but never aiming to clear out and find partners as the great bulk of their fellows had done. That these stragglers did not nest suggests an interesting ornithological problem that one can only answer by assuming an inequality of the sexes, resulting in a number of the birds going about unmated. Such a contingency is as conceivable among birds as among the human race; it may be taken for granted, at any rate, that neither starlings nor other birds would be found living *en famille* in the nesting season unless there was some insuperable difficulty compelling them to spend their days in single blessedness.

The most popular roosting site in this park is a clump of trees on the island in the centre of the top lake. At one time the birds found here all the accommodation they

needed, but their numbers have swollen to such an extent that the trees skirting the lake are needed to shelter the huge flock which no man can number. Sometimes a daw or a rook enters the preserves, but he does not stay long, neither do the gulls that come here periodically. The reason the starlings choose this particular clump of trees no doubt is because it is sheltered and secluded, and by selecting the island they appropriate the best protected situation. The island, moreover, is the home of all the wild fowl that live on the lake, but, as these do not use the trees, the starlings have exclusive possession of the branches. Now, while the starlings seem rather indifferent about the possibilities of the park for food, other birds are more appreciative. Wild and semi-wild are always in residence at this picturesque resort. Most of them have been bred here, and they come and go at will, so that their numbers vary. The gulls visited the lake in large numbers last back-end. At the close of the breeding season the young gulls, mostly the kittiwake, sought this enclosure, coming first in driblets and then by the score. One morning there must have been quite a hundred of these beautiful marine birds.

There are no fish here of any size, but the birds make short work of the minnows and the sticklebacks, which are very active and prolific. The gulls, too, have an eye for other scraps of food, as nothing comes wrong to them. The chief attraction seems to be the fresh water. It isn't every day one may see a gull dabbling and ducking, but these white-winged visitors seem to come here on purpose, for they are all the time spraying their backs, retiring every now and then to the island to preen their feathers. As the autumn night closes in, the starlings begin to appear. Their most interesting movements are to be observed when the birds, having picked up the last grub for the day, prepare for roosting. If you are out in the country you may chance to see some of the starling companies in the pastures; about sunset they make off to the roosting-resorts. The birds do not always leave the

feeding-grounds and go straight for a given mark. They frequently linger *en route*, repeatedly coming to ground in the fields, as if loth to leave the greensward; and one cannot wonder if they hesitate about turning in, because on doing so they must go without food for twelve hours or more, a rather long fast for birds which during the day seem to be always eating.

However, when Fenham becomes their objective, the starlings fly thither straight and fast, as is their wont. Up they come, flock after flock, the birds dispersing among the highest branches of towering elm and beech until the trees are simply alive with a feathered multitude. Meantime, as each fresh battalion arrives, there is kept up an incessant chatter that may be heard a considerable distance away. What it is all about nobody can tell. This collective vocal effort is far from entertaining, and it has no resemblance to the so-called song with which the starling favours us from the smoky recesses of the familiar chimney-pot. In part it may be the outcome of squabbling for places, but even that does not fully explain the noisy demonstration, as the birds may be seen flapping their wings and whistling when there is no sign of temper.

As a rule, this remarkable gathering of bird forces takes place on a particular range of trees which are in a fairly direct line with the roosting-place. One or two of the trees are decayed, and the birds gather on the leafless branches, looking at a distance like so many dots on irregular lines. Some of them remain in the chosen position perhaps for half an hour; others move about from tree to tree, and occasionally solitary couples will detach themselves from the assembly and make off as if tired of waiting for the general departure. Occasionally the birds perch temporarily among the trees at Ravenside or just beyond. One night hundreds of the birds were heard holding disorderly converse at the edge of dark in the trees, the mist at the time being so thick that it was impossible to see across the road. Presently the talk ceased and there was a dull whirr of many wings, a sign

that the starlings had left to grope their way to the roosting trees, where thousands of their fellows had already arrived.

The manner of finally jumping off is as striking and methodical as their arrival at the roosting destination. That the birds regulate the order of their going by some mysterious signal or understanding can hardly be doubted. It stands to reason that the vast gathering of birds could not well fly off simultaneously and drop among the chosen trees with a certainty of each bird finding a safe perch on which to alight. The probability is that if they were to attempt to do so there would be general confusion in the ranks, if not accidents. It is not unreasonable to assume that the birds are aware of these risks, and accordingly take measures to avoid them. Even as it is, when the larger contingents arrive some of the birds seem to get uncomfortable positions, and wander about until they can find a suitable perch.

It is a fine sight to see the various contingents leave the tall trees at Fenham for the Leazes trees. Each flock in turn starts as by word of command, flying at a great height, constantly changing formation, each bird to all appearance equi-distant from its neighbours. The birds come along so quickly that on reaching home they are bound to hover for a second before making their headlong plunge into the roosting trees. Some of them seem to commence the descent almost before their little bodies have lost momentum, with the result that they tumble and turn, gathering their wings for the final drop, plummet-like, among the branches. It takes the birds a considerable time to settle down, and the chatter is louder now than before, as the feathered folk are close at hand, and are spread over a smaller area.

As soon as daylight comes the starlings return to the fields, but their manner of leaving the roosting trees is quite different from their arrival. All the birds now are hungry, and it is a case of go-as-you-please. There is no company dodging and manœuvring. The starlings take

off in twos and threes, and away they go, just skimming the trees and house-tops, mostly in a westward direction, and all bent on getting to the feeding-grounds in the shortest possible time. This mighty gathering at the park goes on until the trees, divested of their leaves, no longer afford the birds protection; then warmer quarters are sought among the farmers' ricks or the isolated reed beds. But the circumstance of the birds changing quarters does not affect their daily methods of assembling and dispersing; in fact, the starling battalions do not break up until the breeding season comes round.

Faculties of Birds Generally.

ONE of the most voracious of carnivorous birds is the gigantic crane, or, as it is termed in India, the *Adjutant* (*Ciconia argala*). It does not, however, rank in systematic arrangements as a bird of prey any more than the bustard, though the latter lives chiefly on animal food.

The structure of the stomach in the adjutant corresponds with this similarity in habit, though the solvent glands are differently formed from those of any other bird. These glands are not placed round the upper portion of the stomach, but form two circular figures, about one inch and a half in diameter on the fore and back part of it, each gland being composed of five or six cells, and each opening into one common pipe. The gizzard and digastric muscle are nearly of the same strength with that of the crow, and the former is lined with a similar horny cuticle.

These birds are not only capable of digesting bones, as Spallanzani proved eagles and owls to be, but they seem to be fond of them, swallowing every bone which they can get down their gullet, whence they are denominated bone-eaters. It has been stated by Sir Everard Home that there was found in the craw and stomach of one of these birds a land tortoise, ten inches long, and a large male black cat, entire.

The adjutants are said to be met with in companies, and when seen at a distance, near the mouths of rivers, coming towards an observer, which they often do, with their wings extended, may well be taken for canoes upon the surface of a smooth sea; when on the sand-banks, for

men and women picking up shellfish or other things on the beach.

One of these, a young bird about five feet high, was brought up tame, and presented to the Chief of the Bananas; and, being accustomed to be fed in the great hall, soon became familiar, duly attending that place at dinner-time, placing itself behind its master's chair, frequently before the guests entered. The servants were obliged to watch narrowly, and to defend the provisions with switches; but, notwithstanding, it would frequently seize something or other, and on one occasion purloined a whole boiled fowl, which it swallowed in an instant. Its courage is not equal to its voracity, for a child of eight or ten years old soon puts it to flight with a switch, though at first it seems to stand on its defence, by threatening, with its enormous bill widely extended, and roaring with a loud voice like a bear or tiger.

It is an enemy to small quadrupeds, as well as birds and reptiles, and slyly destroys fowls or chickens, though it dares not attack a hen openly with her young. Everything is swallowed whole, and so accommodating is its throat that not only an animal as big as a cat is gulped down, but a shin of beef broken asunder serves it but for two morsels.

It is known to swallow a leg of mutton of five or six pounds, a hare, a small fox, &c. After a time the bones are rejected from the stomach, which seems to be voluntary, for it has been known that an ounce or two of emetic tartar given to one of these birds produced no effect.

The Sense of Hearing.

IT has been well remarked by the earliest authors, that birds are not provided like other animals with an external ear, because their passage through the air would have been obstructed by long ears like those of the hare or the ass.

In owls there is a peculiar valve placed at the opening, partly of a membranous, and partly of a muscular structure, which has by some authors been deemed analogous to the human ear, and it is around this that the tuft of feathers is arranged, so as to form a large funnel, which is brought into view when the two folds or lips are separated. The outer opening is very large, parted into two chambers by a square bone, and forming a considerable upright slit in the form of an S, extending as high as the head itself.

The drum of the ear in birds bulges outwards in a somewhat convex form, and consists of two membranes. In order to support, distend, or relax the exterior membrane there is a cartilaginous organ stretching from the side of the passage almost to the middle of the membrane; while there is another cartilage divided into three branches, the middle one of which, being the longest, is joined to the top of the cartilaginous organ before-mentioned, and assists in bearing up the exterior membrane. The cartilage joins the top of the columella (*Ossiculum auditus*), which is a very fine, thin, light, bony tube, the bottom of which expands into a plate (*Sperculum*), corresponding to the base of the stirrup-bone in the human ear, and, like it, fitting the oval hole, to which it is braced all round by a very slender membrane.

M. D. Blainville, in opposition to most other comparative anatomists, and in conformity to the doctrine of minute analogies now pursued on the Continent, endeavours to show that the chain of bones found in the human ear is equally to be found in birds, though in order to make this out he is under the necessity of confessing that, while "the chain of small bones is complete," these bones consist not of bony substance, but of cartilage, sub-cartilage, and even of muscles.

With reference to this speculative theory upon the subject of the ear of birds, Sir Charles Bell justly remarks that "the only effect of this hypothesis is to make us lose sight of the principle which ought to direct us in the observation of such curious structures, as well as of the conclusions to which an unbiassed mind would come. The matter to be explained is simply this: the chain of bones in the ear, which is so curiously adapted in the mammalia to convey the vibrations of the membrane of the tympanum to the nerve of hearing, is not found in the organ of hearing of birds; but there is substituted a mechanism entirely different. They choose to say that the incus, one of the bones of the chain, is wanting in the bird. Where shall we find it? they ask. Here it is in the apparatus of the jaw or mandible; in that bone which is called *Os quadratum*."

From this mode of enquiry we find that the sense of hearing is enjoyed in an exquisite degree in birds; that the organ of the sense is not imperfect, but is adapted to a new construction, and a varied apparatus, suited to the condition of the bird; and that there is no accidental dislocation, or substitution of something less perfect than what we find in other classes of animals.

The internal parts of the ear in birds are much less complicated than in man and quadrupeds. We have little doubt that the provision made for rendering birds more buoyant, consisting of air-vessels extended from the lungs throughout the body, and even to the bones themselves, contributes to render the vibrations of the air more

distinct, muffled as they must always partially be by the feathers of the bird.

The faculty of imitating sounds possessed by certain birds proves that their hearing must be exceedingly delicate; and though we suspend our belief of the great musical talents which some birds are said to have derived from education, we find many well-attested instances of a delicate ear in species by no means remarkable for vocal execution.

Madame Piozzi gives an account of a tame pigeon, which answered by gesticulation to every note of a harpsichord. As often as she began to play the pigeon hurried to the concert, with every indication of rapturous delight. A false note produced in the bird evident tokens of displeasure, and if frequently repeated it lost all temper and tore her hands.

It is again related that a gentleman was staying at a certain house in Cheshire, and the daughter of the host was a fine performer on the same class of instrument. He observed a pigeon which, whenever the young lady played the song of "Speri si" in Handel's opera of "Admetus," would descend from an adjacent dove-cot to the room window where she sat, and listen with every indication of pleasure till the song was finished, when it uniformly returned to the dove-cot.

Who, after this, will aver that birds have not a keen sense of hearing?

Formation of Birds.

IN considering the external form of a bird, the first thing that strikes a philosophical inquirer is the wisdom with which Providence has adapted it to the element in which it is destined to move.

In its smooth pointed bill, and gradually enlarging head and neck, he perceives an instrument admirably calculated to penetrate the yielding air. The rounded prow-like shape of its breast, too, is adapted with mathematical exactness to the same useful purpose; while its flexible tail is made with surprising skill to perform the part of a rudder; and its wings equally poised and furnished with quills and feathers modelled by numerous wonderful contrivances, at once for lightness, for strength, and for tenacity, and altogether exhibiting a machine of the most perfect kind for aerial navigation.

The very varieties in the nature of this machinery, adapted as they are to the faculties and instincts of each species, impress the mind with a deep sense of the minute and skilful care of a beneficent Creator, and give a peculiar interest to the investigation.

When we proceed from the external form to the consideration of the internal structure of birds, as adapted to their peculiar function of moving through the air, we perceive a system of contrivances evidently intended to promote the same end. In the mechanical art exhibited in the formation of the bones and muscles, by which power and motion is given to the wings—in the conformation of all the bones, uniting strength with lightness—in the air so singularly distributed through the bones and in other parts of the body—in the modification of the intestines—

in the whole comparative anatomy; in short, of the winged tribes, we trace, with an astonishment increasing in proportion to the diligence of the research, the same unceasing solicitude to adapt everything to their nature.

Nor is it less worthy of remark that there is scarcely a vegetable or animal production which some species of bird does not seem created to feed upon; and that, speaking generally, wherever that peculiar production is to be found, there is also to be found the particular kind of bird to which it furnishes wholesome food.

With some striking examples of this kind the sportsman of our own country is well acquainted. He finds the partridge in the plains, the woodcock in the forests, the grouse on the moors, and the ptarmigan on the loftiest peak of the mountains. He knows, too, that other species migrate from country to country, seeking their food in distant regions, over trackless oceans, and through an extended atmosphere, when it fails in their native haunts. The ornithologist is aware that instances of this kind are not confined to the birds of game only, but form a rule so universal as to deserve a place among the wonderful adaptations which exist between the animal and vegetable worlds.

Nor is it to be forgotten that of all sublunary creatures man alone is endowed with faculties capable of discerning the Creator's hand in His works. Had not the human race been called into existence all these magnificent provisions would have been unappreciated and unknown.

The glories of the Divine perfections would still indeed have been inscribed on nature, but among earthly existences there would have been no eye to read and no heart to feel them. Man has justly been called the priest of nature; and while from the seen he rises to the unseen—from the temporal to the eternal—he ought never to forget that the high rank that has been assigned him implies a high responsibility; and that, in proportion as his vision is enlarged, and his faculties are exalted, his duties and obligations are, to an equal extent, increased.

Footless Birds.

“**A**LL living creatures,” says Pliny, “have one certaine manner of marching and going, according to their several kinds, unto which they keep, and alter not. Birds only vary their course, whether they go upon the ground or flie in the aire. Some walke their stations, as crows and choughs; others hop and skip, as sparrows and ousels; some run, as partridges, woodcocks, and snipes; others again cast out their feet before them, staulk and jet as they go, as storks and cranes.”

Aristotle has remarked that there is no animal known to fly always as fish are known to swim; hence he concluded that all birds could walk, though such as have small feet were sometimes called “footless” (Apoda).

Some singular beliefs were, however, formerly maintained respecting the feet of birds, which it may be interesting to mention. According to some ancient authors, the bird of paradise was without feet; for none of the great numbers imported to Europe had them. It was even alleged that the inhabitants of Aron believed the bird to be hatched with legs, but apt to lose them, either from disease or old age. The primitive impression that the bird was footless arose from the fact that the leg is extremely slender, and only about a palm in length. The Dutch navigators were challenged to investigate the point, and found that the legs were certainly there but more weak and slender than those of the magpie, and that they could walk and fly like other birds; but the Indians, upon taking them, cut off the legs, and, taking out the entrails, dried the birds in the sun to fit them the better for

ornamental head-dresses. The practice of disembowelling them, in conjunction with their being deprived of feet, led to another singular fancy—that, having no need of food, they lived wholly upon dew and vapours.

There is a British bird—the *Swift* (*Cypselus murarius*)—which has, at least in name, been represented as “footless”; but, though its legs are exceedingly short, the structure of its feet is admirably adapted for their uses. The shortness of the legs and the great length of the wings render it very difficult, if not impossible, for it to rise from any even surface, and, as if conscious of this inability, it is never seen to alight on the ground.

The peculiar conformation of the foot distinguishes the swift from the swallows, and, indeed, from all other known birds; for, though some species have the power of turning one of their toes either before or behind, none but the swift can turn all the four toes of the foot forward. The smallest toe also consists only of a single bone, while the other three toes have only two bones each—a structure adapted to the habit of the bird of clinging to the perpendicular face of walls and rocks and eaves of houses, aided by its strong, sharp, hooked claws.

The feet in swallows, though not quite so short as in the swift, are very small, but peculiarly adapted to the bird's habits. In the capture of its prey, for example, it does not employ its feet. In fact, the great requisite in the foot of the swallow is that it shall be formed without those qualifications which are such wise provisions in the feet of most other birds, for what is a perfection in them would be an imperfection in it.

The *Kingfisher* (*Alcedo ispida*) is another British bird whose legs are exceedingly small and not well adapted for walking, which, familiar as we are with the species, we never saw it attempt. In this it is singularly different from its fellow-fisher, the *Dipper* (*Cinclus aquaticus*), which can not only trip along the edge of a rock, but can walk, as we have repeatedly witnessed, directly under

water in shallow pools and slow-running streams, emerging to the surface at a considerable distance from the place where it had entered. The leg is feathered to the knee, and claws are very strong and curved, the claws of the back toe being the strongest. Its curious habit of walking under water appears to have been first observed by Hebert, whose interesting narrative will be familiar to most naturalists.

The Laplanders call the *Loon* (*Colymbus glacialis*) the lame bird, because it walks awkwardly, the legs, indeed, being so placed as to render it difficult to use them in walking. When one under observation quitted the water it shoved its body along upon the ground like a seal, by jerks, rubbing the breast against the ground, and returned again to the water in a similar manner.

The *Coot* (*Fulica atra*), like the divers, has an aversion to take wing, and can seldom be sprung in its retreat at low water; yet, though it walks rather awkwardly, it contrives to skulk through the grass and reeds with considerable quickness, the compressed form of its body being peculiarly fitted for this purpose, and its progress has often been remarked by the top of the herbage on the edge of a lake moving as if it had been swept by a narrow current of wind. The same preference to run rather than take wing may also be remarked in the *Rails* (*Rallæ*), some of which are land-birds, and amongst these may be mentioned the *Landrail* or *Corncrake* (*Ortygometra crex*), a bird that has been said never to take the water, and keeps regularly upon the ground, taking flight but rarely, and never except when compelled thereto.

Birds Whose Feet and Legs are Strongly in Evidence.

THE bird most celebrated for fleetness in running is the *Ostrich*, or *Bird-camel* (*Struthio camelus*), as it may well be named. "What time she lifteth up herself on high," says Job, "she scorneth the horse and his rider."

According to most writers, the wings serve both for sails and oars, whilst the feet, which have only two toes, and are not unlike the camel's, can bear great fatigue. M. Montbeillard, however, was of opinion that it does not spread its wings and tail-feathers with the view of assisting its motion, but from the common effect of the corresponding muscles, as a man in swimming throws out his arms. Though the ostrich is universally admitted to run faster than the fleetest horse, the Arabs contrive to run these birds down on horseback, their feathers being valuable and their flesh not to be despised.

The best and fleetest horses are trained for this chase. When the hunter has started his game he puts his horse upon a gentle gallop, so as to keep the ostrich in sight without coming too near to alarm it and put it to its full speed. Upon observing itself pursued, therefore, it begins to run at first but gently, its wings, like two arms, keeping alternate motion with its feet. It seldom runs in a direct line, but, like the hare, doubles, or rather courses in a circular manner, while the hunters, taking the diameter or tracing a smaller circle, meet the birds at unexpected turns, and with less fatigue to the horses. This chase is often continued for a day or two, when the poor ostrich

is starved out and exhausted, and, finding all power of escape impossible, it endeavours to hide itself from the enemies it cannot avoid, running into some thicket or burying its head in the sand. The hunters then rush in at full speed, heading as much as possible against the wind, and kill the bird with clubs, lest the feathers should be soiled with blood.

Everybody must at some time or other have seen a partridge run, and consequently must know that no man is able to keep up with it, and it is easy to imagine that if this bird had a longer step its speed would be considerably augmented. The ostrich moves like the partridge, with both these advantages, and there are instances of these birds having put on such a speed as to distance the fleetest racehorse ever bred in England. It is true they would not hold out as long as a horse, but without doubt they would be able to perform the race in less time. Had we but the knowledge and method of breaking it and managing this bird as we do the horse, there is no knowing what speed might be attained by a bird with such prodigious strength.

A British bird, the *Bustard* (*Otis tarda*), now rarely seen, if not quite extinct, is very similar to the ostrich in its faculty of running, being so fleet as to be hunted with greyhounds, a sport followed even by the ancient Greeks, as we learn from Xenophon and Ælian. The male of this species is furnished with a singular bag or pouch, opening under the tongue, and hanging down on the forepart of the gullet, as low as the middle of the neck. This seems to have been observed by Aristotle, but was particularly described by Dr. Douglas, who imagined it was intended as a reservoir for water, indispensable in the extensive arid plains which it inhabits. He found it capacious enough to hold several quarts of water.

Another writer of that period, Colonel Montagu, however, appears to be somewhat sceptical upon this point. "We think it impossible," he says, "that the bird could

fly with such an addition of weight before its wings, which would throw it out of the centre of gravity. We see the heron and many other birds obliged to extend their legs behind and contract their necks when flying, in order to balance themselves on the wing. Seven quarts of water (the quantity mentioned by Dr. Douglas) are nearly equal to fourteen pounds weight, and certainly more than the bird could carry in that situation."

It would appear, indeed, from the observations of Sir Everard Home, that Montagu's objections are valid, for in the *Adjutant* (*Ciconia argala*), which has a bag precisely similar, he found that it contained "nothing but air, which the bird has the power of expelling and filling the bag again at pleasure." In the adjutant the bag communicates with the large air-cells at the back of the neck, and therefore we may fairly conclude it is intended to render the birds light and buoyant for running, since they are too heavy to fly without considerable difficulty.

These birds are remarkable for the length of their legs, which must be very advantageous for swiftness of running; but it would be wrong to infer as a general principle that all birds with long legs are swift-footed. On the contrary, the *Wading Birds* (*Grallatores*), which have proportionately much longer legs than the ostrich or the bustard, are not well adapted for walking on land. Amongst these the *Flamingo* (*Phœnicopterus ruber*) is one of the longest legged birds; yet it is in this respect far exceeded by the *Stilt* (*Himantopus melanopterus*), and the legs in the latter are, besides, slender, and even "so flexible," as Wilson says of the American stilt, "that they may be bent considerably without danger of breaking," as if, in accordance with Pliny's name (*Himantopus*), they had been cut out of a thong of leather.

The reasoning of naturalists, indeed, respecting the conformation of the feet of birds is, when not derived from living specimens, as frequently wrong as right. It has been usual, for example, since the time, if I mistake not,

of Gesner and Aldrovand, to consider the peculiar structure of the foot in parrots and woodpeckers, with two toes before and two behind, as so peculiarly characteristic of climbing birds that in systematic classifications the birds which have their toes so placed are denominated climbing birds (*Scansores*); but, unfortunately for this division, many species which have the feet so constructed have never been observed to climb, such as the cuckoo and the wryneck, while many species which do climb, such as the *Nuthatch* (*Sitta*) and the *Creeper* (*Certhia*) have their toes placed in the usual manner.

White's remarks on the walk of birds are well worth quoting. "Most small birds," he says, "hop; but wag-tails and larks walk, moving their legs alternately; all the duck kind waddle; divers and auks walk as if fettered, and stand erect on their tails; crows and daws swagger in their walk; woodpeckers use their tails, which incline downward, as a support when they run up trees; parrots, like all other hook-clawed birds, walk awkwardly, and make use of their bills as a third foot, climbing and descending with ridiculous caution. All the poultry (*Gallinæ*) parade and walk gracefully and run nimbly."

It is worthy of remark that, as the bones commonly considered as belonging to the leg in birds correspond to the heel of the human foot, all birds must walk, as we may say, on tiptoe. As they have their centre of gravity, however, not directly over their legs, but more forward, it requires peculiar contrivances in their formation to enable them to balance themselves on their toes. Accordingly, birds have their toes for the most part proportionately much longer than other animals, while the great flexion of the leg upon the thigh brings the toes more under the centre of gravity.

Birds have also this further peculiarity, that the standing posture is their state of most perfect rest, arising from the structure of their legs, as first explained by the old Italian naturalist, Borelli. The tendons of the muscles

which bend the claws pass over the joints of the heel and are joined there by another muscle which passes over the knee, so that the bending of the heel is necessarily followed by a bending of the toes. When a bird, therefore, alights on the branch of a tree, the weight of its body bends those joints, and thus puts the tendons on the stretch, which draws in the claws to lay hold of the branch without any seeming effort on the part of the bird.

The Superiority of the Female in Natural History.

ABUNDANT instances are given us in the annals of natural history of this superiority, and the close study of this subject reveals the undoubted fact that the feminine mind controls the action of the paired ones, whether in beast, bird, or fish. The arrogation of this superiority is also acknowledged by the old writers, both in this and continental countries.

Everyone is familiar with the architectural instincts of the elephant, without which irrigation work could scarcely be carried out in hot countries, where the natural beast of burden with us, viz., the horse, cannot be employed. As for road-making and the laying of pipes for drainage he is indispensable, and he is known to exercise a deal of prudence, more so than any other beast of burden. He not only is capable of undertaking tremendous tasks, but he has the natural instinctive quality largely developed of finding out the shortest possible routes to the required rendezvous, choosing the easiest slopes, and thereby gaining his goal with a minimum of exertion, so unlike other animals.

When travelling in herds the female invariably leads, proving that sagacity is more conspicuous in the gentler sex of this gigantic animal.

Take another animal, the gnu. The cows will themselves expel an obnoxious bull from their society without more ado; and so it is obvious that, even among the quadrupeds, the male, for all his superior pluck and much talked of courage, does not have things all his own way.

It has also been observed that in the American prairie the heifer in its infuriation is more dangerous than a bull; for the bull charges straight ahead, as if blindfolded, intent on mastering its foe by sheer force, whereas the more subtle cow will run at the enemy sideways, with a keen eye to an effective sidelong thrust with her sharp horns.

Among the feathered tribe one has abundant instances of the assertion of superiority by the female, and one simple observation lesson will reveal the correctness of this statement, whilst traversing an ordinary country hedgerow.

The ordinary thrush or blackbird female has an extremely dowdy appearance, with a sombre sooty-brown attire, suggesting another bird's leave-offs; but closer acquaintance will reveal the fact that she is bigger, and endowed with more strength than her mate, and that when the commissariat runs short, it is the male that has to go without dinner, should the provision be scanty.

The sparrow is very amusing in his love-making, for his gestures go a certain way to indicate that he is a much superior bird. This notion, however, the female sternly rebukes by administering a decisive dig in the breast, or grabbing him by the scruff of the neck and shaking him heartily. The male again has to haul the materials for the nest, whilst the female surveys the scene, leaving the he-male to negotiate the obstreperous straws, and feathers, and moss hangings, which at length comprise the home-stead.

To use a more familiar illustration still, look at the cock-pigeon, parading round his mate, with swelling throat and sweeping tail, the very personification of dominant masculinity; but the sequel comes later, for he sits on the eggs for the best hours of the day, whilst his wife has enjoyment galore, and so it is easy to realise that the female has the best side of the bargain, at any rate, from a pigeon's point of view.

The male of this species is, in fact, every inch a family

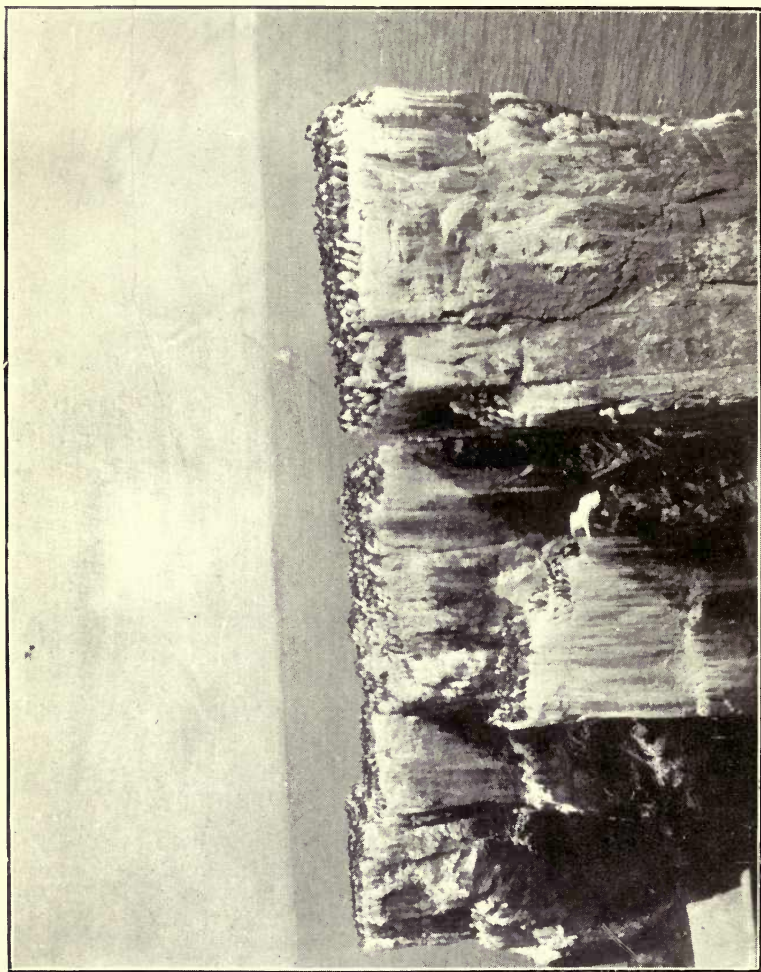
man, and throughout the bringing up of the nestlings he does the homing duties to a nicety. The hen is known to rest in a state of indifference, and considers herself free. If they are unattached their thought is to form other ties, for the erstwhile family tie counts for little.

In the case of birds of prey, it has over and over again been determined that the female is the better of the two. So great is the difference, indeed, in the case of the hawk, in captivity, that the lady hawk has been known to kill and devour her mate, though in a wild state she adheres to the usual traditions of her sex in the monotonous business of sitting upon her eggs and caring for the young.

Amongst the flightless birds, the emu and cassowary, the supremacy of the fair sex has gone still further.

It is well known that the biggest, the brightest coloured, and the more courageous birds of these species, are not the males, but the females. The male birds realise again that the home is their sphere of activities, and they consistently look after the eggs and the chicks. The hen cassowary shows an unbecoming contempt for her mate.

In an experiment of pairing off these mated pairs at the Zoo, some time ago, as related by one of the keepers, the male was discovered some days after with bald patches on the back, doubtless due to frequent and well-directed kicks on the part of the softer sex. This fact brings us to an interesting fact in animal economy; when the male is, as usual, the stronger sex, he is often found to exhibit a chivalrously forbearing spirit towards his mate, as any one may see in the case of the farmyard rooster.



[Photo—A. H. Robinson, Scalby.

“A MIGHTY CONGREGATION.” PINNACLE ROCK, FARNE ISLANDS.

PART II.

The Little Auk (*Mergulus Alle*).

IN the New World it is not abundant, save on some parts of its Arctic shores. In New Jersey it has been seen but rarely.

In the plumage of the summer, or while breeding, the head, neck, upper part of the breast, back, wings, and tail, are glossy brownish black, on the head and neck a somewhat browner tint, the tips of the secondaries are white, and the long scapulars are bordered with the same colour; above each eye there is a narrow speck of white; the under plumage is white, except a part of the long flank feathers covering the thighs, which have the inner webs blackish brown.

In winter the change is confined to the sides of the neck and breast, and the posterior parts of the cheeks, which becomes pure white. Its habits are gregarious; they breed on ledges on rocks; flight imperfect.

So numerous are they in the northern regions that flocks extending for three miles have been seen by travellers, and a single shot has magnetised half a dozen of these birds.

The Turnstone (*Streptilas Interpres*).

THIS bird, which is sometimes called the Hebridal Sandpiper, and by others the Sea Dotterel, is only a winter visitant to the British Isles, and is usually seen on Holy Island from Christmas to February.

It breeds in the north of Europe, and in the cold latitudes of both hemispheres, migrating late in spring from this country. From the time of its return during winter and early spring it may be found in small parties along the shores, frequenting chiefly those parts where there are jutting-out ledges of rock, or the smaller rocky islands.

It feeds on nearly the same substances as the Maritime Dotterels; but, as the name implies, it actively turns over the small stones and other bodies on the feeding ground in search of prey; and it is probable that this is more confined to the particular animals that hide or live under cover.

The flight is rapid, and a shrill peculiar whistle is uttered during it, or when suddenly startled, which easily betrays its presence if associated with the sandpipers or dotterels.

No very authentic account of its breeding in our islands has been given, but it has been conjectured that it makes its haunt as near as Zetland from the fact that it is seen there all the year round. Its nest has often been seen also in Norway. It invariably takes a wide range for its breeding zone, viz., from the Cape of Good Hope, thence to New Guinea and the Straits of Magellan.

The adult breeding plumage is beautifully variegated with black, white, and chestnut. The forehead, eyebrows,

around the auriculars, lower part of the back and upper tail-coverts, throat, belly, vent, and under tail-coverts, are pure white; the crown of the head is black, and is relieved by the edges of the feathers being yellowish; but the auricular feathers streak from the base maxilla stretching down the neck, surrounding the white of the throat, and occupying the whole breast (the white of the other lower part running up in the centre to a point), and the rump deep black; the back, scapulars, and long tertials, are varied with deep black, and clear brownish-orange, some of the feathers being entirely of either colour, while others have the basal half, or the shafts only, black, and these colours do not seem to be disposed regularly, or the same in different specimens; the outer margins of the scapulars are narrowly edged with white, which mixes conspicuously in the general mass; the wings are dark brownish black, the secondaries with a broad white tip forming a bar across the wing; the base of the outer webs of the last quills are also white, showing a triangular spot adjoining to the bar; the upper tail-coverts lie over the tail, so as to conceal the whole of the basal white, and make it appear entirely dark with a white tip; the feet and legs are bright orpiment orange.

The Golden-eye (*Glangula Vulgaris*)

THE *Golden-eye* (*Glangula vulgaris*), which is a very handsome plumaged duck, is an excellent example of the garrots.

As winter visitants, they usually feed on the shallow parts of the coast at the foot of pools or estuaries, seeking their food by diving, and performing that act simultaneously, so much so that it is possible to approach them by easy stages, moving forward and standing stock still alternately, as the birds rise or dive, by which means a sportsman may reach the water's edge. They would then on rising take flight, never attempting to escape by again diving, as a grebe or diver would do.

The adult male has the head and upper part of the neck rich glossy green, the feathers of a loose texture, and capable of being much raised at will; the chin nearly black; but a conspicuous mark is an oval spot behind the base of the maxilla of pure white, which can be seen in flight even at a great distance.

The lower parts of the neck, breast, belly, and vent are pure white, the long flank feathers having the outer part of their inner webs black; the back and mantle part of the scapulars and long tertials black; the outer scapulars white, having their exterior webs margined with black; the intermediate wing-covers and last secondaries pure white; the quills and tail blackish brown; legs and feet orange.

In the female the head and neck are umber-brown, the breast grey, and remaining under-parts pure white.



[Photo—S. H. Smith, York.]

SHOVELLER DRAKE, WINTER PLUMAGE.

The Common Shoveller (*Anas Aypeata*).

THIS very beautiful and interesting duck is of considerable rarity in Britain, generally considered as a winter visitant, but now known to breed in limited numbers in the marshes of Norfolk. Nests have been discovered in the Firth of Forth, where at one time was a good deal of marsh land, and many small reedy pools of water.

In its habits it is regarded as an inland bird, but at times it is shot on the shores of some of our islands. Another authority regards it as promiscuous in its feeding, and never procures its food by semi-immersion, nor does it dive unless when hard pressed. In America it is much esteemed for the table, and the menu of the Duke of Norfolk years ago at a special feast consisted, among other fowl, of four seapeys and two shovellers.

Bill black, the head and neck in some lights appear brown, in others rich green, but anterior to the eyes, and on the crown and throat there is the least reflection of the bright colour; lower parts of the neck, breast, scapulars, and sides of the rump, pure white; back blackish brown, gradually shading to greenish black on the rump and upper tail-covers; whole of the wing anterior to the greater covers with the outer webs of the large scapulars greyish blue; the latter have a remarkable form, the inner white web being produced in a narrow point beyond the outer; the lower scapulars are greenish-black, the tips along the shafts for a narrow space, white; lesser covers clove-brown with white tips, secondaries bright green; belly, vent, and flanks, chestnut-brown; under tail-covers glossy blackish green; tail clove-brown, with pale edges.

The Common Pintail (*Dalifa Caudacuta*).

THE *Common Pintail* (*Dalifa caudacuta*) or *Sea-Pheasant*, is a periodical visitant, arriving late in autumn, and occurring chiefly during winter, both in inland lakes and fens of the south and on the coasts of England and Scotland. In Scotland, however, it is by no means frequent, and it is nearly certain, as an old writer correctly observes, that the long-tailed duck has been mistaken for it on the Western Island and northern coasts, where its presence has been regarded as more frequent.

In the male the colours are very decidedly marked: the head, throat, and forepart of the upper neck are umber-brown; on the crown, with the feathers having pale tips, and on the hind head and sides of the head and auriculars, having a bright purple gloss; the hind head shades gradually into deep greenish black, forming a dark nuchal stripe joining with the grey plumage of the upper parts; the fore part of the neck, breast, and belly are white, that colour running up in a narrow lateral stripe between the umber-brown throat and dark nape; on the belly and sides the feathers are minutely freckled with grey; the vent and upper tail-covers black; the lateral covers edged with white. On the upper surface the lower part of the neck, back, and part of the scapulars are marked with zigzag bars of black and yellowish-white, giving a grey tone to the whole.

The Knot (*Tringa Canutus*).

THIS bird, from its very different seasonal dress, has also undergone a variety of nomenclature, but is now understood in its changes. It is not known as a summer bird with us, or as breeding in this country, although it remains sufficiently long to attain its full breeding dress, and often returns with it only partially changed.

After they have recovered from their migration they are rather shy and difficult of approach; at other times again they may appear utterly regardless of danger, and on Holy Island, Northumberland, one may often manage to get within ten or twelve yards of a large flock of these birds, mostly of the first year's growth. These latter must be those that have recently arrived from their long flight, for, even when disturbed by a shot, they would not remove more than from fifty to one hundred yards, alighting and crowding the tops of the isolated rocks which are found mostly near the caves or "coves" of this island.

In the plumage of incubation we see the reddish-orange predominating; all the face, crown, and under parts, from the chin downwards, are of that tint, on the cheeks slightly spotted with brownish-black, and on the crown and occiput having the feathers broadly marked in the centre with the same colour. The centre of the back, scapulars, and long tertials are deep blackish-brown, on the first having the feathers broadly margined with buff-orange, on the latter having them irregularly blotched, and cut into with yellowish-white.

The quills are clove-brown, paler on the inner webs, and having the shafts broad and white; the tail is dark brocoli-brown, tinted with rufous.

In the adult full winter dress, the plumage above is brocoli-brown, on the crown and back of the neck with the centre of the feathers darker, on the back having the shafts only dark; the under parts of the bird are pure white, having the feathers on the cheeks and neck dark in the centres; on the breast these are broader, and on the flanks they are distributed in irregular waves; the rump and upper tail-coverts are white, barred with clove-brown; the tail is nearly of the same tint, with the upper plumage, the outer feathers paler in shade, all narrowly edged with, and having the shafts yellowish-white. Its breeding-place is Northern and Arctic Europe, Northern and Arctic America, and New Holland.

Richardson's Skua (*Lestris Richardsonii*).

THIS species has been evidently considered by many authors as the true parasitic or Arctic gull, and it has been described as *L. Parasiticus* and *Crepidatus*. It is certainly the most common of the British Skuas.

It breeds in the Hebrides, Orkney and Shetlands, where it is more diffused and more abundant than any of the others of its kind.

The entire plumage is usually of a greyish clove-brown, paler beneath, the edges and bend of the wing only being white; the auriculars and sides of the neck slightly tinted with shining sienna-yellow.

Before passing from this remarkable species of gull, I may say it is generally stated that they derive their whole food from their energetic pursuit of other birds, using what they are made to disgorge.

In the somewhat analogous case of the fish-hawk, we know this is practised; but at the same time these birds can and do forage for themselves, and one is almost inclined to believe that the Skuas are not quite dependent on the work of others, but occasionally seek food for themselves, and that the large species will feed on carrion thrown upon the coast.

The writer must here confess that he has never seen these birds employed for themselves, but there is the possibility of their industry in this direction.

The Common Skua (*Anas Crecca*).

THE *Skua* is a northern bird, appearing on our shores in autumn and beginning of winter.

Specimens have occurred on the coasts of Norfolk, Essex, Kent, Sussex, Devon, and Cornwall, and they have been observed on the Solway Firth, on the Northumberland coast, Holy Island notably, and far up the Firth of Forth. These seem almost its most southern range; and it is there seen now flying swiftly over the waves, now pursuing some of the weaker gulls, following them about as a hawk does a small bird, and generally finishing the chase when the victim has given up its own prey.

Scotland is supposed to be out of its breeding range, for the isles of Shetland is its southern limit for this purpose, and St. Rona's Hill has been long known as a favourite station there; it incubates in pairs, making the nest among the moss and heath (not on rocks as the true gulls), and during this time both sexes are very fierce and courageous in defending their property, driving off all animal intruders, and they are said even to attack man when he enters upon their precincts.

The more proper territory of the skua is, however, northward; it is found in the Faroe Islands, Norway, and Iceland, Nova Zembla, and Spitzbergen. It is a powerfully made bird, little inferior in size to the lesser black-backed gull, but of a thicker and stronger make.

The ground colour of the plumage may be said to be shades of clove-brown, the feathers in the centre yellowish and reddish-brown; on the head and neck the feathers are pointed, and the yellowish-brown prevails on the sides and

auriculars; on the lower parts the ground tint is paler, and in the centre the reddish-brown prevails; the secondaries, quills, and tail are nearly brownish-black, the base of the quills with their shafts white; the tail is rounded; legs and feet black, front of the tarsi irregularly scaled, the other parts with small prominent rounded or oval scales, rough to the touch, and reminding one of the fish-hawks.

The Eared Grebe (*Podiceps Auritus*).

THIS, doubtless, is the rarest of the British species. It remains to a great extent a matter of doubt as to the exact place of breeding, and in consequence of its very rare occurrence its habits are not so well known as others of the grebe family. Various English counties are accredited with its capture, but Northumberland stands pre-eminent in this respect. It is supposed to breed very rarely in the north, and its range is said to be Eastern or North-Eastern Europe and Asia. It is also common in the Adriatic.

The bill is black, about an inch in length, measured from the forehead; depressed at the base, and having the tip slightly reflected; lore blackish-red; crown of the head and short ruff round the neck, shining black; from behind and below the eyes, on each side, a tuft of long, slender, shining, orange-buff feathers, which cover the ears and nearly meet behind; throat, neck, sides of the breast, and upper plumage deep shining greyish-black; flanks and sides reddish-brown, mixed with greyish-black; secondaries white; under plumage white, with a silky lustre.

In the plumage of winter it closely resembles the horned grebe, but may be distinguished by the turned-up form of the bill, and the eared grebe is altogether more slender and graceful.



[Photo—S. H. Smith, York.

GREAT CRESTED GREBE.

The Great Crested Grebe (*Podiceps Cristatus*).

THIS bird—sometimes called by authors the dab-chick—is a large and fine species, the largest of the genus, and in the plumage of incubation has an imposing appearance from the rich coloring and ample adornments of the head and neck. Unlike the divers, the larger grebes have their range to the southward, and continue resident in many of the English counties for the whole year, and more particularly in the fenny districts; to the North of England they become more unfrequent in summer; in fact, it is scarcely ever seen on the borders during summer.

It is only met with here as a winter visitant. In Holland it may often be seen on the inland waters, and, in fact, it can be seen almost anywhere between Norway and the Mexican coast, so universal is its range. It has been descried passing through the air in flocks of seven to fifty in number.

The nest, placed among reeds or aquatic herbage, is formed of decayed plants, and is sometimes of considerable bulk. The old birds at this time are very wary, the female sliding almost imperceptibly from the nest, dives, and rises at a distance, leaving her track without a possibility of being discovered.

The usual characteristics of the species are : forehead and crown greyish brown, and on each side of the latter the feathers become elongated, and form two lengthened tufts, the colours gradually shading into deep greyish black; from the base of these tufts, around the auriculars and

throat, springs an ample ruff, which can be displayed at pleasure; the chin and below the eyes shading into orange-brown, which deepens in shade towards the terminal end of the ruff, where it becomes lustrous greyish-black; the occiput and neck succeeding the ruff are chestnut-red and brownish-black intermixed; the back of the neck, upper parts, and wings are blackish-brown, darker on the back, and therewith slight greenish reflections; secondaries white; the back of the neck tinted with grey; the fore part of the neck below the ruff, breast, belly, and vent, silvery white; sides of the breast and flank, dashed with brown and chestnut.

It is noticed that the young birds want the ruff and the deeper rufous tints in the plumage, and it used to be considered that these were the distinctions of the nuptial dress, but in specimens kept by the Ornithological Society the ruff has been retained throughout the year in one or two instances.

It would be exceedingly interesting to know at what age this bird retains a permanent set of plumes.

The Scaup Pochard (*Fuligula Gesneri*).

THIS very handsome species will give some idea of the general form of the pochards.

In form these birds are compact and heavy, the wings comparatively short, but sharp pointed, and propelling the bird, when once fairly raised, by short but rapid and oft-repeated strokes. The body is broad and depressed, of a form fitted for buoyancy, but at the same time, from its weight, sinking deep in the water when swimming.

This bird is a regular winter visitant to the coasts on the North of England and South of Scotland, and from the testimony of most writers it is nearly equally so on both the southern and northern extremes of our island.

It arrives about the end of October, and continues with us till spring, frequenting the lower lying coasts of a soft or muddy character, and feeding on the smaller bivalves, which are generally found there in abundance. Its usual practice is to stick to the sea in preference to fresh-water streams. It is a shy and wary bird, assembling in flocks and feeding together; at the same time, with a stormy wind, one can openly get within shot, especially when feeding in the muddy creeks of the Solway Firth.

The male in full plumage is a showy bird; the bill is a bright bluish-grey, with a black nail; the head and neck blackish-green, with glossy green and purple reflections, the plumage full, and of a silky texture; the lower part of the neck and breast are deep black, belly and flanks white, the vent waved with narrow lines of blackish-grey; the

mantle and scapular feathers, contrasting with the other dark plumage, are clear greyish-white, strongly marked with wavy zigzag lines; quills black, secondaries having short black tips, but with the base white, forming a light bar; lesser covers traversed by white lines; legs and feet bluish-grey, webs darker.

The Great Grey Shrike (*Lanius Excubitor*).

THE shrikes are generally of a size and form exhibiting a moderate degree of strength, and do not show any indications of raptorial disposition, except in the strong and toothed form of the bill; and in many of the species, the centre feathers of the tail being longest, an elegance and lightness to their shape and figure is imparted, at variance with the powerful form necessary for contest.

The Common Grey Shrike is perfectly typical in its form, and will rank among the larger species of the genus. In length it is about nine inches, appearing more graceful from the graduated form of the tail, though it is in reality a firmly and compactly made bird.

In the old male the upper parts are of a chaste and clear pearl-grey, while the whole of the under parts are pure white; these tints are beautifully broken and contrasted by the deep black of the greater portion of the wings and tail, and by the marking of the same colour which appears on the forehead, the lores, and on the auriculars; on the latter there is an oval patch resembling in form and situation the distribution of the darker shades on these parts of the falconidæ.

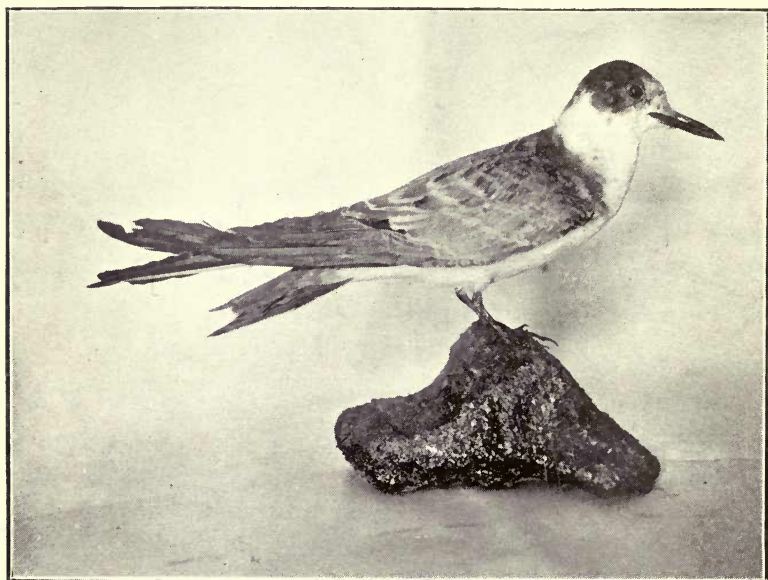
The wings have the base of the primaries white, forming a triangular mark on these parts, and the exterior tail feathers, with the tips of all the rest, except the two in the centre, the space widening to the outside, are of the same pure tint. The female has the colours in general duller, and the breast is undulated with narrow dusky transverse bars.

The bird is only an occasional visitant to the British Isles, and that even of rare occurrence, except in some of the southern and midland counties of England. Towards the north and on the confines of the border, it becomes less frequent; in the South of Scotland it is a rare bird, a few instances only of its capture having been noted, neither have any instances of its breeding in this country ever been recorded.

The eggs are from five to seven in number, they are of a blueish or greyish white, spotted and blotched over with brown or purplish grey.



EGGS AND NEST OF SANDWICH TERN.



[Photo—S. H. Smith, York.

BLACK TERN, WINTER PLUMAGE.

The Terns.

OF the Tern species the *Roseate*, or *Sterna Dougallii*, is the most elegantly formed of all the kinds, but it is, in the North of England at least, uncommon.

Going back a hundred years or so, these birds were peculiarly rare in and around the Farne group of islands. In fact, for some years prior to the period named above the species was represented by just a pair in the breeding season. As years rolled on they brought others, till half a century ago writers spoke of these birds as being numerous, but in our day they have again vanished, and only a few individuals are ever seen south of Scotland.

Their breeding place on the Farnes was formerly on the outskirts of the station occupied by the Arctic Tern.

All these birds are very light, the body being comparatively small, and the expanse of wings and tail so buoys them up that when shot in the air they are sustained, their wings fold above them, and they whirl gently down like a shuttlecock. This bird is remarkably buoyant. They are of most delicate form, the pale tint of the mantle, the rosy hue of the under parts when newly killed, and by the bill being black as far as the nostrils, the base of it only vermilion-red. The forehead and crown passing narrowly below the eyes, and terminating in a peak on the back of the neck, deep black; the mantle and wings very pale grey; rump and lower back, white; tail long, and outer feathers narrow.

The Razor-bill Auk (*Alca Torda*).

THIS species on some coasts is nearly equally abundant with the Guillemots, and resembles it much in habits, breeding in the same manner and gregariously on the same rocks, appearing off our shores and in our firths and inlets during the winter in small parties.

They are easily approached in a boat, but they do not allow the hunter to come so near as the guillemots, diving or taking wing when a boat approaches to within thirty or forty yards. The wings are shorter, and it has a more rapid flight, which is swift while it lasts. It seems to skim the water in winter time.

This member of the Auk family is found breeding in suitable localities over a long range, viz., from Sheſland to the Isle of Wight, and thence southward. It is supposed to be equally abundant on the continental shores, but there is uncertainty as to the exact southern limit.

Certain it is that the Zoological Society has received specimens from Tangiers; in the Arctic Seas it is also found. It has been found breeding in the fissures of rock in British North America.

In the breeding plumage the head and neck are brownish black, of a paler or browner tint on the throat, a narrow streak of white extends from the culmen of the bill to the angle of the eye; the plumage is thick and soft; above, very deep brownish black; the secondary quills tipped with white, forming a narrow bar across the wing; tail cuneated with the centre feathers, narrowed towards the tip; under plumage entirely white; the bill black, transversely furrowed, with a line of white in that of the centre; legs and feet nearly black.

In the plumage of the first year, when it is known under the name of Black-billed Auk, the bill is very weak, and the indication of the white streak to the eye is just marked; the upper parts are as in the adult breeding state, but without the lustre; while the chin, throat, cheeks, and sides of the head, as well as the under parts, are white; the light colour passing over nearly to the occiput, where it is very slightly clouded, and the feathers become gradually purer, the tips for a certain space only being dark.

The Puffin (*Fratercula Arctica*).

THIS curious bird, usually called Sea Parrot by naturalists, is found in this vicinity all the year round. Its usual companions, the Guillemots, also accompany it on the Farnes during breeding time.

It may be said to take an exceedingly wide range during the summer, for some of the species breed on the southern coasts of France and Spain. On the Bass Rock, in Scotland, the holes in the ruins of the old fortifications afford a retreat, burrows being also made in the shelving ground in front of the building. On a small rocky island opposite the harbour of North Berwick a large colony of these birds used to resort.

Various island and northern tribes in whose neighbourhood they breed have been known to use its flesh as an article of diet, and the "Voyagers round the Coast of Scotland and the Isles" have stated that their chief sustenance consisted of the small sea-fowl (puffin). They have been known to breed in large numbers in Labrador, hence the previous statement that the bird takes a very wide range for its haunts.

Now as to plumage. Cheeks and throat pale grey, when viewed from the side appearing as a round pale patch on the side of the head; the colour is darker at the sides of the chin and immediately behind the eye, where the line separating the auricular feathers from the others is apparent; eyes protected by a large scale above and below, that above triangular, that below oblong; crown forming a band to the occiput, collar round the throat, upper parts, wings, and tail, black; on the crown and collar, tinted with grey, under parts pure white.

The bill occupies the whole face of the bird, is very much compressed, and is traversed on the mandella by three, on the mandible by two furrows; the colours are bluish-grey and orange-red; the sides of the mouth are furnished with a corrugated orange-yellow skin. Feet and legs orange-red.

The Velvet Scoter (*Ædemia Fusca*).

THE *Velvet Scoter* (*Ædemia Fusca*) is generally designated the Velvet duck or double Scoter. This fine species is also a sea duck in the most extensive sense, and is a winter visitant on our coasts. They are easily taken by the gunner, who can generally contrive to get quite close and well within range, for the extreme shyness which is oftentimes attributed to them is not a reality. They do not usually rise until the pursuer is within forty yards of them.

Their food is chiefly bivalve molusca, frequently those of a very hard structure; the strong covering of their very powerful gizzard enables them easily to bruise and triturate. Its range of migration is also very wide, for out of Britain the continental ornithologists have found it in Southern Italy. Its places of nidification are, however, not narrated, but it has been observed by northern travellers in Norway, Sweden, and Scandinavia, and in Lapland it is common everywhere. In North America it is also migratory.

Plumage entirely of a deep velvet black, except a pure white spot on the lower eyelid, which passes behind the eye in the form of an acute angle, and the tips of the greater covers, which are of the same colour, and show a bright and strongly contrasting bar across each wing; on the head and neck the colouring is without lustre and soft; the base and margin of the bill are black, the other parts bright orpiment-orange; inside of the tarsus carmine-red, toes orange-red, the membranes black.

In the female the plumage is brownish-black, paler on the under surface, on the auriculars a patch of greyish white; the bill and legs have not the vivid colouring of the male.

The young much resemble the female during the first year, the white spots on the head being apparent; the feet beginning to show their brilliant colour.

The Red-breasted Merganser (*Mergus Serrator*).

THE *Red-breasted Merganser* (*Mergus Serrator*). It makes its nest, like the Eider, with its own down a few yards from the water of the more retired Highland lochs. When the female commences sitting she is left by the drake, which retires and completes its moult, after having assumed a somewhat duck-like appearance.

In form and colouring the female resembles in many points the Dun diver, but the handsome male has the head and neck greenish black, mingled with a few reddish-brown feathers; the occiput adorned with a long loose crest; the chin yellowish white; the lower neck and upper breast reddish-brown; the back, sides of the breast, scapulars, and quills, black; the lower part of the back, rump, tail, and flanks, grey, the latter with narrow irregular bars of black; the breast, belly, and vent, pure white; the greater wing-covers and secondaries, white, each with a black base, which forms a double bar across the wing; the tertials white, with a narrow edging of black; but a most conspicuous marking is seen in a few rather large feathers which spring from either side of the breast above the bend of the wing, and over which, while the bird is at rest, they fold—these are pure white, with a margin all round of deep black. The colours are more distinctly marked in the breeding season, as with most birds.

The Great Northern Diver (*Colymbus Glacialis*).

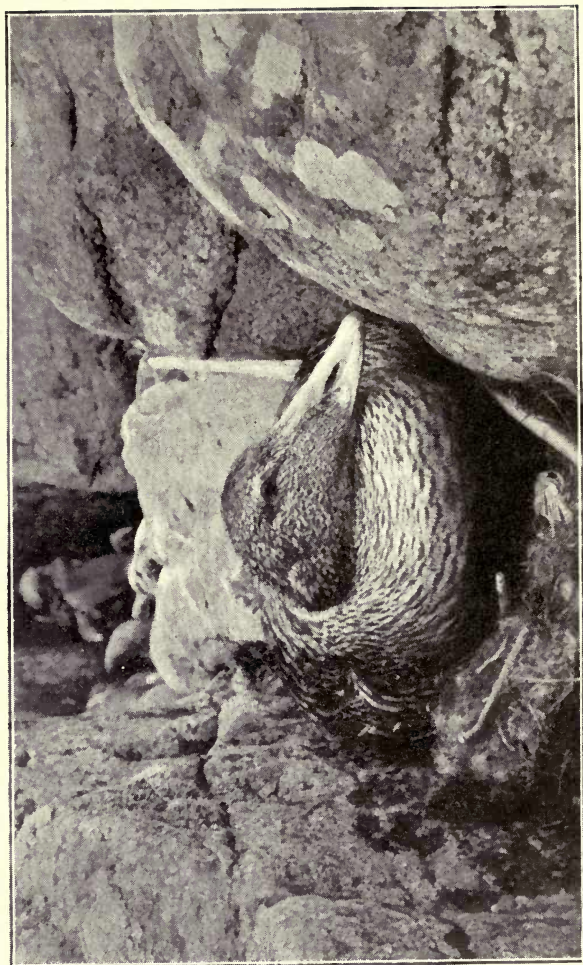
THIS very handsome bird occurs on the shores of England, during winter, in a manner similar to the black-throated diver, but less frequently; and upon all the British or Irish coasts it is much more rare. From the Firth of Forth to the Tyne may be said to be his favourite grounds during a hard winter. It breeds in the Faroe Island, Iceland, and even as low in latitude as the Highlands of Scotland.

A curious bit of Lapland folk-lore may be inserted here. The inhabitants of this far north region believe that should a person hear the cry of any of the divers in the spring, and while fasting, the milk from his flocks will not curdle for the whole year.

The people here make two sorts of hats from the skins of the different divers, which are either given as presents or sold to traders on the coast. The one kind, and which must have rather a handsome appearance, is made from the skins of the Great Northern diver; the shape of the head is formed out of several skins sewed together, and an entire skin, with neither the head nor tail cut off, is placed overhanging, the head and bill turned in front. The other kind of hat is made of five skins of the neck of the Northern Diver, with a portion of the breast specially prepared.

In the plumage of the first year, when the bird is known as *Colymbus immer*, the whole under surface is pure white, shading upwards on the head and neck to greyish-brown or clove-brown; the back and wings a very dark

similar tint, each feather broadly margined with grey; the bill pale, except along the culmen; the inside of the tarsi and toes of a much lighter colour. The adult male, in spring, or at the commencement of breeding, is a remarkably handsome bird, as follows: Bill black, paler towards the tip, nearly three-quarters of an inch long, much compressed, tapering, the upper mandible gently arched, the lower one channelled beneath and deepest in the middle, the angle sloping gradually upwards to the point; tomia of both mandibles inflected; head and neck black, glossed with purplish green; transverse bar upon the throat, middle neck, collar, and sides of the upper part of the breast, black, the feathers having raised white margins, which give these parts a striated appearance; the whole of the upper plumage glossy black, each feather having two pure white spots, one on each side of the shaft near the tip, forming rows; those upon the scapulars and tertials large and quadrangular, but becoming small and nearly round upon the lower part of the back and rump. Flanks and sides black, spotted with white, the rest of the under plumage white; the long axillary feathers the same, with a black stripe down their centres; tail short and rounded, consisting of twenty feathers; legs greyish-black.



EIDER DUCK AND NEST.

The Common Eider (*Somateria Mollissima*).

THIS gaily-plumaged but rather clumsily-formed duck is a good example of the genus. It is completely maritime in habits, frequenting the sea coasts or islands, and in its distribution is a northern bird. In North America it is noted by many ornithologists, but New York is usually the limit of its range southward.

The plumage of the head is short and soft; the forehead and sides of the head running in a line with the lower part of the eyes, and terminating in a narrow point opposite the nostrils, rich bluish black, having in some lights a deep bluish tint; this is divided on the crown from the line of the eyes backwards by a narrow line of greenish-white; the occiput and sides of the neck, with a large patch rounded inferiorly pistachio green, the feathers being rather long and stiff, capable of being raised at will; the cheeks, neck, back, and sides of the rump, pure white; breast, rich cream-yellow; the wings above the greater covers, scapulars, and tertials, white, tinted with straw-yellow; the latter loose in their webs, and curved over the wing; the rump and upper tail-covers, belly, vent, and under tail-covers, black; the greater wing covers short and black; secondaries blackish-brown; quills and tail greyish-brown; bill and legs greenish yellow.

Among the small parties on our shores, many birds are noticed of a piebald appearance, and are really those that have not attained their complete dress, which includes a period of four years, the time allotted by the large majority of British writers.

The female has a more subdued plumage altogether.

The Common Shelldrake (*Tadorna Belonii*).

IN the full adult state of this bird, from the decided markings of clear white, reddish-orange, and black, it is one of our most beautiful and clean-looking ducks. It is a truly maritime species, or a shore duck, being seldom or never seen far inland, nor frequenting fresh waters, except during the season of incubation.

It breeds in the holes and crevices of rocks, and when near a warren selects the rabbit burrows. When the young are hatched, they are conducted to the sea, and are sometimes carried in the bill of the parents to their protecting element. If come upon when the young are newly hatched, the old birds endeavour to lead off the intruder by feigning lameness, like some of the rasores and grallatores, but when they have reached a more advanced state, unless a dog is present, they almost invariably fly straight away.

Head and neck glossy blackish green; lower part of neck and upper breast pure white, succeeded by a broad pectoral and narrow dorsal band of pale chestnut-red; centre of back, rump, tail, shoulders, lesser wing-covers, sides, and thighs, pure white; scapulars, quills, and tip of the tail, black; tertials white, outer webs broadly edged with chestnut, separated from the white by a dark line shading into both colours; centre of the belly and running through the chestnut band, black; vent and under tail-covers, pale yellowish red.

The young birds have not the bright colouring or decided markings of the old; the chestnut colours are

more of a blackish-brown, and the white is clouded with grey. The glossy black of the head and neck is also wanting; the fore part of the neck being white, the crown and back of the neck blackish-brown.

Of the Ruddy Sheldrake only a few specimens are found in this country.

The Common Wild Duck or Mallard (*Boschas Fera*).

THIS common and useful species is abundantly distributed over all our British Islands, few localities being without some parts suitable for their habits, and many districts being peculiarly adapted for them; at the same time causes similar to those which have operated on the frequency of many other species have very materially diminished the numbers of the wild duck, and among the most serious is the profuse system of drainage which has taken place in many of the lower lying counties of England, where decoys and the produce of the fens furnished a regular and often handsome income.

Upon the sea coast there is always a considerable number to be seen during winter, and in severe weather, but bearing no proportion to the large flocks of wigeon and some of the true sea ducks.

One peculiarity which will always distinguish it as a species is the dark green curled feathers of the tail, showing a development or variation carried out in other parts or in other ways among the members of this or other very nearly allied genera.

The young males in their first dress resemble the female. The males, after the season of incubation has passed, lose the green head and distinguishing plumage of the upper parts, and become of a more sombre tint.

A sight that is very rarely met with is the happy contentment exhibited by an animal and bird side by side in one nest.

A gentleman who, a year or two ago, had a fancy for



[Photo—S. H. Smith, York.

NEST OF WILD DUCK.

keeping homing pigeons, all at once missed a pair from his loft, and after diligent search the culprits were found at the rear of the dwelling-house, the male cooing its love-song, whilst the female covered a couple of eggs, and in close proximity—in fact, only an inch or two distant—was the domestic cat, fondling, in a curled-up position, her progeny of five kittens. Perfect harmony prevailed, and the young pigeons were duly hatched, and took to themselves wings.

Speaking of peculiar bed-fellows, I discovered a nest near the Lough last year containing fourteen eggs, six of which were that of the mallard duck, and the remaining eight were partridge eggs, presided over by the hen mallard. It was, to the naturalists, a great disappointment when the nest was eventually harried, for it would be hazardous to speculate on the composition of the brood.

The question has often been asked, "Does the mallard duck breed in captivity?" The best solution is centred in the fact that at the present time, on this island, what is termed the common duck (hen mallard) is sitting hard on ten eggs. This bird is one of five that have been winged, or in some other way captured, and the little flock, with wings clipped, go about similar to the ordinary farm-yard duck, and they are prolific in the matter of egg-production similar to the ordinary farm-yard duck, though the eggs are laid in batches, as though intended only for incubation.

The Common Wigeon (*Mareca Penelope*).

THIS bird, also called "Whew" by authors, is exceedingly shy, and though it breeds inland, it frequents the coast more commonly than many others.

From the hallux being slightly lobed, and from the bill having that peculiar blue colour seen in the scaups and pochards, and altogether, although its habits of feeding are more goose-like and grallatorial, there is something that assimilates it to the maritime species.

The male wigeon, like most of the other ducks, receives his full and beautiful plumage in complete perfection in spring, putting it on in winter, but gradually attaining more brilliancy as the season for pairing advances; while, after incubation, it becomes of a more unobtrusive description, approaching nearly to that of the female.

In the male, in adult plumage, the bill is bluish-grey, black towards the tip, and having the nail of that colour; the forehead and crown are pale buff-orange, chin and throat black, while the rest of the head and neck are rich orange-brown; breast purplish-red, tinged with grey; belly and vent pure white; the back, scapulars, sides, and flanks are finely waved with irregular bars of black and white; smaller wing-covers next the shoulders grey, the other pure white, the greater covers with black tips.

Wigeon delight in feeding on the same food as noted when referring to the brent. This food is a long weed with succulent white roots, which grows on the mudflats in various estuaries and on the coast. Its scientific name

is *Zostera Marina*, but it is known in many places locally by gunners as "wrack grass," "zos," "wigeon weed," and so on. At daybreak the ducks seek the open sea or bays for safety during the day, but if the weather is boisterous they will fly along-shore in trips searching for a safe shelter. At such times they also often resort to the mudflats, and should any fresh-water stream run through the flats at low tide the ducks will be found during bad weather in incredible numbers sporting and drinking, or else dead asleep in the vicinity of such quarters. But ducks are hardy fowl, and little shelter will suffice for them; thus it is only at places where the tide recedes far out from the mainland that ducks may be met with availing themselves of such conditions. The sea ducks feed day and night, according to tide times and conditions of the weather.

Shore birds—*i.e.*, those of the wader tribe—are very regular in their habits in winter. As the tide flows and so covers their feeding-grounds, shore birds of the commoner kinds, such as curlew, plover, godwit, redshank, knot, and dunlin wing in small parties higher up the estuaries or along the coast to places where sandbars, salting edges, or islands are to be found, and on which they may rest until the tide recedes. Their chief feeding-times are governed by the tides; thus it is compulsory for them to seek their food both day and night.

They feed most greedily between half-ebb and ebb tide, but when high spring tides are running, which keep their grounds covered so long with water, they become anxious to feed as soon as the tide has left bare the first tract of feeding-ground. In autumn, when high tides occur and no resting-ground on the shore is left bare at top tide, the shore birds will often resort to large pastures, fallow fields, and such places inland. If disturbed, they then take wing to sea, where they will fly for hours together until the tide again ebbs.

Shore birds of the larger and more worthy kinds, such

as curlew and godwit, when much persecuted become exceedingly wary, and fly high when crossing what they know to be dangerous spots; but in the usual course of things these birds, if unmolested, make their daily tidal flights at no great height. Flying against a strong wind, they merely skim the ground, only rising a little to take the banks.

The Common Teal

(*Boschas Crecca*).

THIS small species is one of our most beautiful ducks, the male in adult plumage exhibiting a richness and variation which can scarcely be exceeded. It is not nearly so shy a bird as many of our wild fowl, and with ordinary care may always be approached; when disturbed, it flies in circles around, wheeling somewhat like plovers; and if taken at the proper time, several may often be procured at a shot.

The nest is found generally at a distance from the water, placed dry, often among brush or young plantations, formed upon the ground, upon the same plan as that of the mallard.

In Scotland it is not generally regarded as migratory, but in England it is essentially a winter visitor, making its appearance by the end of September, the numbers increasing during winter by additional arrivals from the north of Europe; at the same time, several instances of its breeding are given. It also breeds in captivity, for instance, in the Zoological Gardens.

The similar bird found in America was at one time considered identical. The distinctions consist principally in the white crescent-shaped band, which crosses the sides of the breast nearly in a line with the bend of the wing, and in the want of the white scapulars which form so conspicuous a line down each side of the back of the European birds. The distribution of the colours on the head are also different.

The Brent Goose (Anser Brenta).

THE *Brent* is also a winter visitant; most numerous on the eastern coasts of Scotland and England.

On the north-eastern shores they are entirely maritime, not being known to leave the water mark, or ever to feed on the pastures or young grain. During ebb-tide they feed on the banks of *Zostera Marina*, then uncovered, the "*ulva latissima*" having ofttime been found in the stomachs. At other times they rest on the sandbanks, which are quite open, and afford no shelter for approach; or they ride, as it were, just off the land, buoyant upon the wave, and occasionally pluck the sea grass or weeds, which are yet borne up within their reach.

During the feeding-time, or when resting, they are clamorous, and a flock is heard at a considerable distance from the regularity of the call of all the members, which is simultaneously kept up. They are also extremely wary, and most difficult to approach openly; and from experience it is best to obtain shots, either at night by lying in wait in the line of the flight, or by coasting in a punt on a day when the wind is favourable, when they may either be "run into," or watched for in the range of flight.

The geographical range is northwards; we have it in Shetland, and in Northern Europe, Iceland, Hudson Bay, Greenland, and Nova Zembla.

The head, neck, and upper part of the breast are dull black, on the sides of the neck an interrupted patch of white; back, scapulars, rump, and under parts anterior to the legs clove-brown, paler on the latter, each feather

having the tips and margins of a lighter shade; flank feathers tipped with white; vent, upper and under tail-coverts, the latter exceeding the tail in length, pure white; tail clove-brown; quills and secondaries, blackish-brown; bill, legs, and feet black.

The sexes do not vary much in plumage.

The Pink-footed Goose (*Anser Brachyrhynchus*).

THE bird was first noticed as new to Britain in the year 1839, when specimens were exhibited to the Zoological Society, but at a remoter period it was known as the short-billed goose. These birds are generally regarded by fishermen as the forerunners of the flocks of Arctic, brent, and other geese which come upon our shores at the end of the year. About half a dozen are annually shot at Holy Island.

In extreme length it is about two feet five inches; bill of a livid pink; the nail black, but pale towards its base; the base of the bill is surrounded by a narrow list of white, and the head, cheeks, and throat are dark olive brown, shading into yellowish brown upon the neck; on the back and scapulars the base of the feathers is greyish-brown, each towards the tip inclining to yellowish-brown, and finally tipped with yellowish-white; the upper tail-covers pure white, having the crescented pale mark common more or less to the three species; tail (of fourteen feathers), dark at the base and broadly tipped with white, the shafts of the feathers of the same colour; the wings, except the quills and greater covers, are of a paler tint, the feathers tipped with the same colour with those of the back; quills are black at the tips, shading into pale grey on the outer webs, with very strong, broad, white shafts; the greater covers are dark brownish-black.

Below, the colour of the neck gradually shades into a yellowish-grey on the breast and belly, interrupted by the darker base of the feathers, further shading into pure white on the vent and lower tail-covers; the sides and feathers covering the thighs are greyish brown, each feather broadly tipped with white. The feet and legs of a livid pink, the nails pale at the base, with dark tips.

The Common Night-Heron (*Nycticorax Gardenii*).

THERE is a distinguishing hoarse call uttered by birds of this particular species, and hence its nomenclature of raven.

They feed invariably during the night, and remain inactive in the day-time.

They are generally distributed over the different quarters of the globe; breed in companies, and on trees, and have the plumage of some dark chaste shade of grey, olive, or brown, above; white below, but tinted in parts with the same colour as that of the upper parts; the head crested generally with three long narrow feathers.

This bird ranges over Europe and America. In Britain it is of occasional appearance, like most of the rare species (egrets, bitterns, &c.), and there is no instance of the bird having bred in the British Isles.

Several times they have been captured both on the coast and on the borders of inland lakes. They are described as extremely noisy and watchful, their sense of hearing being particularly acute; at the same time they are easily procured by lying in watch, and shooting the birds as they come into their nests or to roost.

The nests are of considerable size, and are constructed of sticks and roots; the eggs are of the pale bluish-green common to the greater part of the Ardeade. The young are esteemed, as food, equal to young pigeons, and seem to be sought after both by man and the rapacious birds, which collect around the breeding stations for the supply which is at this season there furnished.

The back of the neck, wings, rump, and tail, are of a fine pearl-grey, palest on the back of the neck; the forehead, cheeks, throat, and under parts, pure white; the crown of the head and nape, with the upper part of the

back and mantle, are of a rich glossy greenish-black, the feathers on the centre of the back being rather long, and having their webs unconnected, as in the true herons; and from the occiput springs a beautiful adornment of generally three pure white narrow feathers, which reach to the back. The bill is black; the legs greenish-yellow, appearing of a clearer colour as the bird attains maturity.

The specimen captured on February 24, 1909, and brought to the writer, measured thirty-eight inches. It was a male bird in adult plumage, and weighed over six pounds. The shore gunner was secreted in a fissure of the rock facing the harbour, over which the crowds of brent geese wing their flight at eventide, and the heron was observed making for the estuaries, which are formed by the sea and mudflats, at half-flood tide, when a well-directed shot brought it down.

Hérons are melancholy birds, remaining for hours on the edge of the waters. But though they seek their food in a solitary manner, they build their nests in company; as many as eighty nests have been seen on one tree.

The word *anapha*, translated heron in Scripture, has been variously understood. Some have rendered it the kite, others the woodcock, the curlew, the crane. Another authority thought it to mean the mountain falcon, the same that the Greeks call *anopea*, mentioned by Homer, and this bears a strong resemblance to the Hebrew name.

An outcry raised in Scotland against the heron as a destroyer of trout has led to strong protest by many in the bird's favour as a destroyer of eels. "If," says one writer, "heron destroyers would only turn themselves into rook destroyers, they would do much good to the farmer and to sport in general, as the crows (rooks) are far the greatest enemies of farmers, and are besides persecutors of the herons, who keep down the eels, which are so destructive to the trout." The heron also feeds largely on water-voles, shrews, and beetles which live in the water, particularly *Dytiscus marginalis* and *Geotrupes stercorarius*, and also grass.

The Hooper or Wild Swan (*Cygnus Ferus*).

THIS species is the most common in Britain, being a general winter visitant, frequenting at this time the coasts of England, and the lochs, together with occasionally the shores and inland estuaries of Scotland, in severe weather frequently ascending the courses of rivers for many miles. They are said to come from the north, though some years ago they were said to breed sparingly at Orkney.

There is no doubt but that the greater mass migrate and incubate in the northern countries of Europe. We have, however, few records of an extra-European range, the American bird being now considered distinct.

In confinement to artificial waters, this swan seems very readily to accommodate itself. In the gardens of the Zoological Society they have repeatedly bred.

The wild swan is easily distinguished from the others by the want of the knob and black base of the bill. This member is orange-yellow for more than half its length; the colour extends forward on the edges of the mandible, and forms a lengthened triangle of that colour, the apical portion of the bill is black.

The plumage is pure white, but on the head, cheeks, and upper part of the neck there is often a variation streaked with reddish-brown; the young are often of a dull brown; internally the trachea forms a convolution inside the keel of the sternum, entering and returning inside of the osifurcatorius; the bronchial divisions are of considerable length.

Bewick's Swan (*Cygnus Bewickii*).

THIS distinct species of swan only began to attract attention about the years 1827-8, although one or two ornithologists have previously examined specimens, and pointed out distinctions. Soon after its dedication, to hand down to posterity the Ornithologist of Newcastle, was by common consent recognised. It is generally supposed to breed in Iceland. Many specimens have been procured in various districts of England, Scotland, and Ireland.

The adult plumage is white after passing through the changes of dull brown. The head and neck are also generally streaked with rufous. But it is easily distinguished by its lesser size, and by the colouring of the bill, which has the greater part of its terminal portion black, the orange at the base assuming nearly the form of an oval spot carried out to the eye.

This species has also a convolution of the trachea within the sternum, but it enters the cavity outside the osifurcatorius, and the bronchial divarications are very short.

The Purple Sandpiper (*Tringa Striata*).

GENERIC marks: Bill longer than the head, slightly bent down at the tip, dusky, the base reddish-orange; head and neck dusky brown, tinged with grey; back and scapulars black; with purple and violet reflections, the feathers edged with deep ash; breast, grey and white; under plumage white, streaked on the flanks with grey; feet ochre-yellow. Length eight and a quarter inches. Eggs yellowish-olive, spotted and speckled with reddish-brown.

The Purple Sandpiper is described as being far less common than the Dunlin, and differing from it in habits, inasmuch as it resorts to the rocky coast in preference to sandy flats. The few specimens seen by the writer were associated with Dunlins, flying with them, and so closely resembling them in size and movements that a description of the one equally characterises the other. It was only, in fact, by the coloration that I could discriminate between them; and this I did, on several occasions with great ease, having obtained my specimens singly while they were surrounded by other birds.

This bird is very numerous in Orkney and Shetland, appearing early in spring, and leaving again at the latter end of April, about which time it collects in large flocks, and may be found on the rocks at ebb-tide, watching each retiring wave, running down as the water falls back, picking small shell-fish off the stones, and displaying great activity in escaping the advancing sea. It does not breed there.

The bird has a wide geographical range. It has been often observed in the Arctic regions, where it breeds about lat. 78°. It is also well known in North America, and is found in various parts of the continent of Europe, especially Holland and Jutland.

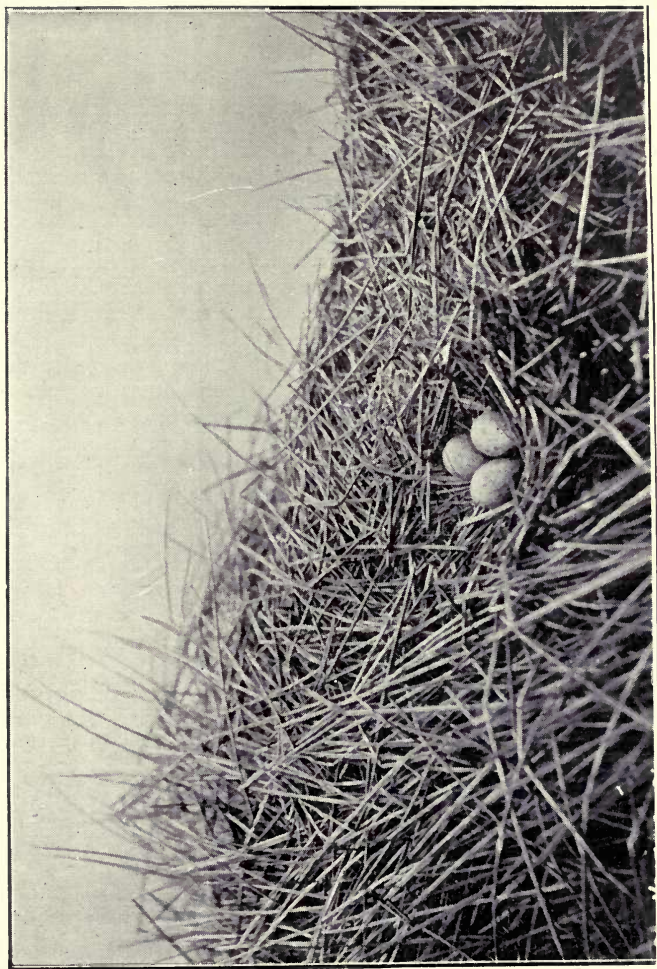
The Great Black-Backed Gull (*Larus Marinus*).

GENERIC features: Wings extending but little beyond the tail; legs pale flesh-colour; length, thirty inches; breadth about five feet nine inches. In most other respects resembling the Lesser Black-back Gull. Eggs stone-buff, blotched, and spotted with dusky brown.

Of the two Black-backed Gulls, the Greater, or "Cobb," is by far the less frequent on our coasts, and when seen generally occurs in pairs. It remains with us all the year, but is most frequent in the south during winter.

In spring, Great Black-back Gulls for the most part withdraw to cliffs and rocky islands far north, as, for instance, the Orkneys and Hebrides, where they are numerous, a few only nesting southwards. Unlike most other gulls, birds of this species are unsociable even in the breeding season. They build their nests on the most inaccessible parts of the rocks, and reserve the situation entirely to themselves, not even permitting birds of their own species or any other intruders to settle there. They are exceedingly wary, and give notice of the approach of danger to other animals. Consequently they are held in dislike by the gunner, whether in pursuit of sea birds or seals.

Like the rest of the gulls, they are omnivorous, but are, more than any others, addicted to carrion, in quest of which they often wander inland; hence, they are sometimes called Carrion Gulls. "If a floating prize presents



[Photo—S. H. Smith, York.

NEST OF BLACK-HEADED GULL.

itself," says Mr. St. John, "such as the remains of a large fish, or dead bird, it is soon discovered by one of the large gulls, who is not, however, allowed to enjoy his prize alone, for every one of his fellows within sight joins in tearing it to pieces. When I have winged a duck, and it has escaped and gone out to sea, I have frequently seen it attacked, and devoured almost alive by these birds."

Stations occur here and there on the coast of England in which the Great Black-backed Gull builds. It sometimes resorts to a marsh at the breeding season, but retains its habit of driving away all intruders. Its eggs are prized as dainties, being thought to resemble plover's eggs. The writer has on several occasions enjoyed the few presented to him by the keepers on Farne Islands, for here they incubate freely.

The finest specimen of this species was brought to me during the past winter. When outstretched, its wings measured seventy-two inches.

The Red-Throated Diver (Colymbus Septentrionalis).

GENERIC markings : Bill slightly curved upwards, not exceeding three inches in length; head, with the edges of both mandibles much incurved, throat, and sides of the neck mouse-colour; crown spotted with black; neck both above and below marked with white and black lines; on the front of the neck a large orange-coloured patch; back, dusky-brown; lower parts white. Eggs chestnut-brown, spotted with a darker colour.

There is similarity between the Crested Grebe and the Red-throated Diver, so much so in general shape as to merit by some the general term of "Loon." Amongst the old writers, too, this generic term is sometimes applied, for instance, by our countrymen, Ray and Willughby, with this difference, the Great Northern Diver is called "Loon," and the species about which I am now writing "Lumme."

The birds are said to be numerous on the coasts of the Isle of Wight, passing and re-passing in small flocks and in lines about a mile or so apart. This species, like the rest of the genus, obtains its food by diving; when pursued it rarely endeavours to escape by taking wing, though its power of flight is somewhat remarkable. It is also common for fishermen to note them passing through the water at good speed, and at a considerable depth, propelling themselves by a free and active use of their wings. The customary time for the visits of these very interesting birds is from October to the end of May.



RED-THROATED DIVER.

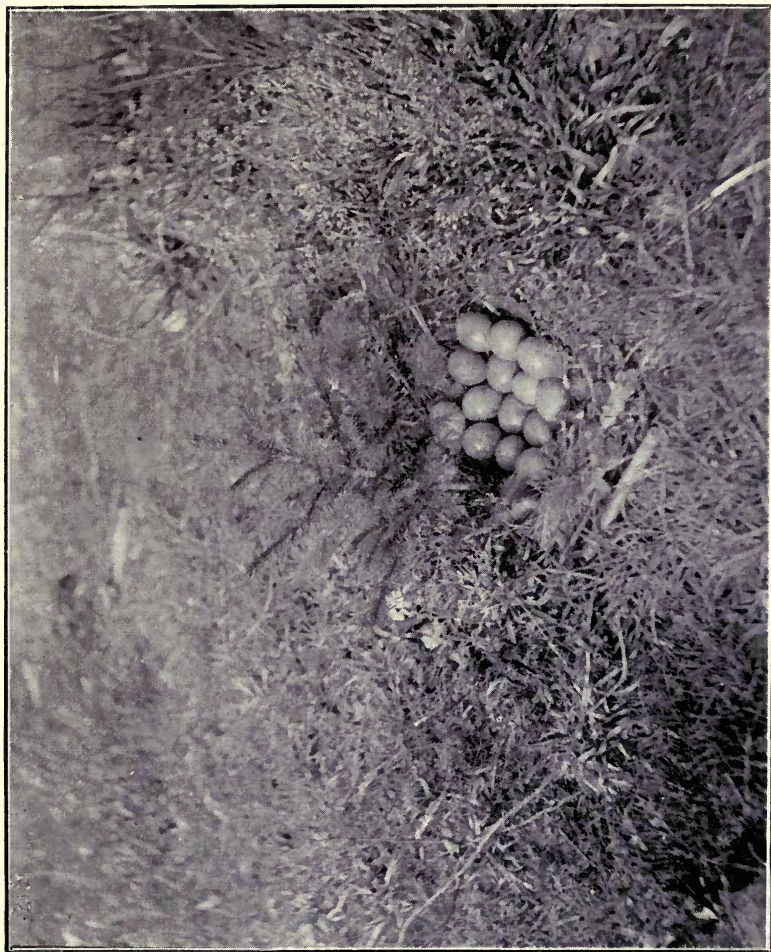
Towards the end of spring they withdraw northwards, and build their nests, chiefly of coarse grass and herbs, usually close to the edge of some fresh-water loch. They lay two eggs, and the male is said by close observers to take his turn in the task of incubation. Stray couples breed in the Orkneys, Outer Hebrides, and in the north of Ireland.

The Common Pheasant (*Phasianus Colchicus*).

ACCORDING to the old writers, this bird has a most remarkable ancestry, as its reputed introduction into Europe took place more than a thousand years before the Christian era, whilst its arrival into Britain is said to have been about the time of the First Edward. It has been fostered and preserved, from time almost immemorial, on account of its ease in rearing, the beauty of its plumage, the extreme delicacy of its flesh, and the cover which it gives to the sportsman. Its range is universal in the British Isles, though in Ireland it is certainly not so evenly distributed owing to the lack of preservation.

In Europe, or wherever they have been introduced, one may notice two birds of different plumage, the one with a conspicuous white ring upon the neck, the other with the ring minus.

In the preserves at home, in consequence of close breeding, the mark becomes modified or entirely obliterated. Again, the female appears to assume at times an entirely pure white plumage more frequently than the male. Like its neighbour, the partridge, various foreign invigorating strains have been introduced, notably the various European importations. Crosses with the common hen, black grouse, &c., have in many cases proved successful. Coloration of plumage, and the differentiation, is often attributable to the semi-domestication to which these birds are subjected in the preserves. They are much inclined to become spotted or pied with white, and often show very beautifully contrasted markings.



[Photo—S. H. Smith, York.

NEST AND EGGS OF PHEASANT.

II.

Mr. Harwood Brierley says :—

The prodigious cost of the pheasant-rearing hobby does not decrease. Abundant proof exists that it is firmly established and of national importance. Had that great naturalised bird, "*Phasianus colchicus*," and the handsomest of all birds save one, been left to take care of himself he would most assuredly have become ere this as extinct as the dodo. At any cost he must henceforth be reared under artificial conditions, and to meet the growing demand for eggs of different breeds more and more game-farms appear to be coming into existence annually, many of the best being in a position to book up their orders well in advance. Of practicable and fancy sorts there are now pheasants galore, so that a beginner is often undecided which sort or sorts to rear in the face of discussions and recommendations which are not always the outcome of experience. A Norfolk game-farm selects from a stock of 250,000 eggs which include the Mongolian-Chinese cross, the half-bred Mongolian, the Park-necked, and other much advocated breeds, and it is no unusual thing to find such eggs advertised as yielding birds "exceptionally hardy and easy to rear, free from disease, grand flyers, and non-strayers," while "every egg (is) guaranteed fertile"—some of which statements we are disposed to doubt. Another growing industry is the preparation of pheasant biscuits, foods, stay-at-home covert mixtures, and scent destroyers; while the country carpenter benefits by building sheds, mess-houses, brood-hen boxes, and coops. The game preserver has to maintain a special staff for feeding and watching the birds, repressing the vermin, etc.; the quantity of hard-boiled hens' eggs alone consumed in a season representing a heavy item on his bill. Pheasant shooting is general enough to take the lead in sporting gunmanship, and it causes many thousands of pounds to be distributed annually in a legitimate manner, as witness the busy gunsmiths' shops, the employment of game-

keepers, loaders, beaters, stops, etc. The battue cannot fairly be decried, because a good deal of training and not a little dexterity is needed to bring down a couple of rocketers with a right barrel and a left. You will hear a youthful beater say to his neighbour as a bird falls, "Up goes a quid, pop goes a penny, and down comes three bob!"—which is equivalent to saying that a pheasant costs a sovereign to rear, but only realises three shillings for the city man's dinner table. I can prove that on some estates there are bad seasons when each bird costs £2, if all the expenses are reckoned up closely; and if a manorial lord wishes to circulate his wealth in this fashion for the good of the country, pray do not seek to make the taxation intolerably burdensome, or he will go abroad to spend it.

THE COVERT.

The best pheasantries have their home and distant coverts, which usually take a parallelogram or curvilinear form. They abound with fir, larch, yew, birch, ash and sycamore, and "rides" are cut through a dense undergrowth of rhododendrons, hazels, willow, holly, laurel, elder, guelder-rose, snowberry, privet, and barberry. The plantations enclose oblong patches tilled for buck-wheat and other small crops, which can be applied for feeding the "chicks of the covert," and keep them from wandering away to other "liberties." In the very heart of these Phasianic Elysian Fields are the rearing grounds, much divided by wire fencing, and overlooked by the upper windows of the head-keeper's brick cottage, while at different points are kennelled watch-dogs, whose breed or training disallows of continuous barking except when provoked by intruders, so that the preserved area remains as fearsome to poachers as it was under the old dispensation of man-traps and spring guns. George Wother-
spoon, one keeper so stationed, to whom I came by recommendation on my tour, very aptly quoted from Holy Writ: "The lines are fallen on me in pleasant places; yea, I have a goodly heritage." He readily conducted me

around an old-fashioned flower-garden, along an aisle between lilacs, laburnums, and rhododendrons in bloom, along one side of a cherry orchard, and eventually planted me on a bench facing the extensive rearing-fields, where refreshment was served. After about half an hour's chat I had to undergo a punctilious introduction to a couple of under-keepers.

FAMILY AFFAIRS.

The lord of the manor, or his lessee, wants as many pheasants for the autumn shooting as can be conveniently accommodated in the surrounding coverts, and the game-keeper's future depends on the realisation of his ambition to show a large head of game. "*Phasianus colchicus*" and the allied breeds make a notoriously careless, shiftless, selfish motherhood, and the slightest alarm will usually cause a bird to desert her post at the sitting period. At another time she will consider her own safety a good deal more than that of her progeny. However superficially amorous Prince Colchicus may be, it is clear that he takes no real interest in family matters, but prefers to gallivant about. Any sort of a nest is tumbled together under a bush or hedge, or in the undergrowth, wherein is laid a clutch of fourteen or fifteen olive-brown and minutely speckled eggs. It is admittedly the better way to spend time systematically searching for these eggs, or there will be a tremendous wastage in stock, so addicted is the hen bird to shirking the full discharge of duties incumbent on her by setting off with an incomplete brood, thus deserting many valuable eggs perhaps just when they are about to chip, with the result that carrion crows, rooks, magpies, rats, &c., pounce upon them. At all times pheasants of both sexes are incorrigible wanderers, the careless mother going foraging long distances, minding not if her family is fagged out, losing some of them before the day is over, and taking not the trouble to look for them. The result is that a few succumb to "clash," leaving only two or three survivors to tell the story of their

wretched life. Temporarily or permanently deserted eggs, some already chipped, are each season recovered and brought home to the incubator (which often has a holding capacity of 300), where the chicks made their exit within a few hours. The chief value of an incubator lies in the fact that eggs of uncertain age can be dealt with easily, and the chicks dried off as soon as they leave the shell; for this drying process represents a very critical stage. Further, when chicks are hatched by an ordinary brood-hen they can be removed to the incubator's drying chamber in order to avoid the risk of being crushed to death by the fussy foster-mother.

The pheasants on any estate could soon be numbered on one's fingers were it not for the employment of incubators and domestic brood-hens. The very shyest, wildest bird from the covert, the very courtliest or most reserved Prince Phasianus himself, has in all probability some strain of the foreign or English barnyard fowl in him; a detailed pedigree going far enough back would almost certainly show that he had benefited directly or indirectly by some dowdy yellow hen or a lifeless incubator. Thus the pheasant has lost his or her claim to rank among the wild winged game of the field or copse, and as far back as the time of Elizabeth the male bird was known to cross voluntarily with the ordinary domestic fowl fetched originally from Indian jungles. I have myself observed Prince Phasianus attempting to fraternise in the poultry-yard, as showing what a fearful rake he may become in spite of all our specialised stay-at-home covert-mixtures. Decided hybrids have been brought home to my very door, and become pets and playthings for children, while two miles away the highly burnished Phasianus himself strutted like an independent lordling. His territory had its human custodians, who were also purveyors of wholesome food, and general attendants on his person, and though professing to be too proud to rub shoulders with them, he would never hesitate to creep out on the sly to pick up the food thrown down.



[Photo—S. H. Smith, York.

NEST AND EGGS OF PARTRIDGE.



[Photo—S. H. Smith, York.

SITTING PARTRIDGE.

The Common Partridge (*Perdix Cinerea*).

AVERAGE length of male specimen from thirteen inches, female less. This might justly be termed an universal bird, for it is found generally throughout Europe. In Egypt and the North African coast it might well be regarded as migratory.

With the solitary exception of the northern moors, it is everywhere abundant throughout the British Isles. It is perfectly true that wherever man brings into cultivation the wastes, there the partridge delights to roam, and there he assists in husbanding, though in a different sense, the grain which civilisation supplies. The more richly cultivated land harbours the greater number of these birds. They choose their mates usually very early in spring—the first mild days of February being not too early—and they haunt the vicinity of their future nesting-places. Their plans, however, for incubation often take a procrastinating form, for it is not unusual to find only half grown birds in the month of September.

They lay variously; sometimes one discovers a nest of a dozen eggs, and even twenty may be seen in a scooped-out hollow, or, preferably, a furrow of tilled ground, and this mode of nidification prevails almost interruptedly through the whole genus.

Concealment is not in the nature of the plump little bird, neither is there any great pretention to a nest, properly so called. Neither is the selection of the site always on *terra firma*, for instances are recorded of trees being appropriated for this purpose. "Far from the

madding crowd" is not by any means applicable to this species of bird, for invariably he chooses the most frequented parts.

During the incubatory period they are extraordinarily tame, and will allow the keeper or even strangers to approach to within a foot or two of the nest. Neither are they, at times, particular as to the companionship they keep, for I have discovered on more than one occasion quite a complex array of eggs. For instance, last year I came across a combination of partridge and mallard duck eggs, in the proportion of eight to six. I visited the spot several times, and usually found the partridge, but once I discerned the duck, as if one had kept watch for the other, and had taken their turns. Never were they seen sitting together. As a naturalist, I was particularly interested in the development of this phenomenon, and anxiously awaited the forthcoming strange brood. I was, however, denied this, for the nest was ultimately harried.

That the parent birds sedulously protect their young is conclusively proved, and the crows and similar rapacious birds have been seen to beat a hasty retreat.

I have seen that the partridge can adopt different forms of defence, and it has been known to feign lameness, and even death, as a stratagem to get rid of the aggressor. They utter, at these times, terrified screams, and appear to be retreating with broken limbs, and, like the wary peewit, will conjure up all kinds of devices to draw the trespasser, be he human or animal, from the vicinity of the nest.

During the breeding season, like most birds, they assume a deeper and more majestic coloration, and in the male there is seen a slight imitation of the wattle incident to the true grouse, and this shows a pinkish colour.

In the female the tips of the feathers become more decidedly marked with somewhat pale yellowish-gray. There is no other bird, however, with, perhaps, the exception of the pheasant, that is so liable to variation, and

this comes about more markedly in recent years, probably in consequence of the introduction of foreign strains for crossing purposes. Both the French and the Hungarian birds have been largely used for this purpose.

The partridge is a flat runner, and the sportsman, in his novitiate days, is not a little deceived as to the whereabouts of the birds, after alighting to the ground. In order to ensure their salvation, they use their legs very nimbly in running a considerable distance.

II.

From inquiries made on estates in different parts of the country, the writer learns that all is well with partridges, although nearly every correspondent laments the scarcity of nests. However, so far as the keepers are concerned, the birds are breeding under ideal conditions, everything possible having been done to safeguard them. Never have rats and other vermin been so closely killed down, and the crow or magpie nest which has escaped the keeper's keen eye is cleverly concealed indeed. Foxes, too, must wonder at the care bestowed upon them, and never have vixens had an easier task to feed their cubs; food, such as freshly killed rabbits and rooks, has been placed near every earth, the idea being to keep the vixen owning it from hunting and interfering with sitting birds.

Foxes are very deadly among partridge broods when the latter first hatch and run, as the chicks trailing along after the two parent birds leave a very strongly scented trail, and once a fox strikes it he has no difficulty in following it till the brood is found. If it were not for the clever habit the old partridges have of fluttering away and decoying a fox from the youngsters, hardly a brood would escape destruction; but this device does not always answer if the aggressor is a fox several seasons old who has learned from experience. Keepers say that they would sooner have a dozen youngsters to contend with than one a year or two old, the cunning of the latter enabling it

to be exceedingly destructive. Hunting men cry out for old foxes, but the game preserver for young ones.

A few seasons ago we watched a kestrel hawk stealing young partridges from a brood a few days old, and anyone who witnessed that sight would no longer proclaim the innocence of the bird. From what we saw, we arrived at an opinion that long grass is the best protection a brood can have, as the chicks have sense enough to bury themselves in it, and, strive how it may, the hawk cannot disentangle a chick from among it. The hawk clutches grass and all, cannot disengage its prey, and dare not stay long because the old birds attack it. A peculiar fact about the hawk is that, however heavy its burden, one claw only is used to carry away the prey. The writer has never seen a hawk employing both.

Old partridges with broods are very careful to avoid other partridges, evidently aware of each other's propensity for stealing chicks, for there can be no other reason. We have never seen two young broods in the vicinity of each other, and, however many occupy a field, each lot keeps to its own domain. Parent partridges are especially fearful of any barren pair which dares to venture near their brood, and at once drive those birds away—at least, the cock does so, assailing both male and female of the barren pair, and following them up till their retreat is assured. Keepers often wonder at the appearance of a pair of partridges with but one or two youngsters, when other adjacent coveys are large, and these are more frequently a barren pair which has stolen a chick or two than a pair which has lost nearly all its brood after hatching.

The Wood Pigeon (*Columba Palumbus*).

GENERIC features : Head, cheeks, neck, and upper parts of the tail, bluish grey; back and wing-coverts, darker; a white crescent-shaped spot on each side of the neck surrounded by scale-like feathers, with green and purple reflections; primaries grey towards the base, white in the middle, and dusky towards the extremity, with the outer web white; tail barred with black at the end; abdomen whitish; bill orange, powdered with white at the base; iris light yellow; feet blood-red; claws brown. Length, sixteen and a half inches. Eggs pure white.

Three or four centuries ago the taste for keeping pigeons of different sorts was as strong as it is at the present day, and the popular names of Runts, Croppers, Carriers, Jacobins, Tumblers, Chequers, &c., modern though the names may sound, were then applied to the very same varieties which are described in the books of to-day. Many of these were of foreign origin, and well known at a remote period in various eastern countries, so that there can be no doubt that the custom of keeping tame pigeons is of very ancient date.

The pigeons in some of their habits approach the gallinaceous birds, with which accordingly they are classed. They are furnished with long and powerful wings, by help of which they can sustain a rapid and continuous flight. They seek their food mostly on the ground, but do not scratch with their feet, and are more given to bathe in water than to flutter in a bath of dust, though in this habit also they not unfrequently indulge.

The crop is large, in which the food supplied to their young is partly macerated and reduced to a kind of pulp

before the young are fed. This process is carried on more by the agency of the receiver than of the giver, as the young birds, instead of opening their mouths and allowing the food to be dropped in, help themselves by inserting their bills into the sides of the old bird's mouth.

Their mode of drinking differs from that of the true gallinaceous birds; they do not take short sips, lifting the head after every draught, but satisfy their thirst by one continuous immersion of the whole bill.

They build their nests of a few sticks, and lay two white eggs.

The food and habits of wood pigeons vary with the season. In spring and summer they are most frequently seen alone or in pairs. They then feed principally on the tender leaves of growing plants, and often commit great ravage in fields of beans and peas. Spring-sown corn is attacked by them both in the grain and the blade, and as soon as young turnips have put forth their second pair of leaves, they, too, come in for their share of devastation.

As the season advances, they visit the cornfields, especially those in the vicinity of their native woods. They prefer, above all, those parts where the corn has been laid by rain or wind, and where a neighbouring grove or thicket will afford them a ready retreat if disturbed. They have become a scourge of agriculture, and hence the war which is now systematically waged, by organised shoots, against them. They are in great demand as an article of diet, but, being very cautious and shy, are somewhat difficult of approach. I have given my experiences, however, in the article which follows.

THE ENEMY OF THE FARMER—THE QUIST.

It is true that the yeoman in the centre and south of England has latterly been relieved of this pest by the recently organised pigeon drives, notably in Herefordshire and the neighbouring county of Gloucester, but sad havoc is still wrought by these birds in spring and the

beginning of harvest. I have seen whole patches of peas, beans, &c., laid waste by the wood pigeon in spring, whilst the storm-beaten wheat and barley comes in for wholesale devastation. Of course, there is sport for anyone who cares for a shot at these birds, and the farmer welcomes with open arms such aid in ridding the land of such a pest. I know the country pretty well from Berwick-upon-Tweed to Lizard Point, a range of some 360 miles, and I can say with assurance that no applicant for a day's shooting among the quists is ever refused.

When last I engaged in this sport I pursued the following tactics: I arrived in the county of Herefordshire, in the Ross-on-Wye district, one evening in spring, and, having asked permission of a neighbouring farmer, I sallied forth the following morning at daybreak, and, having constructed a bower of cut branches in the vacant space between two thick bushes, close to the young peas, I awaited the early birds. Soon was heard the whistle of wings as a bird alighted in the branches of the over-arching tree. An upward glance revealed the culprit, and down came number one. This bird I placed in position among the growing crops, and a very short time elapsed before number two alighted close by. The moment it reached earth I fired, and thus gave the dead bird a companion. This sort of warfare went on, firing at short and long range—viz., from fifteen to forty yards—till eleven o'clock, when I repaired to my temporary homestead for lunch, carrying 26 plump birds.

The next day I selected the other extremity of the farm of two hundred acres, where a similar crop had been sown, and, although I had fewer birds, I managed to do well to the tune of 18.

My best day at this sport, however, was in Wiltshire, on a farm, bordering well-wooded land, belonging to the Marquis of Aylesbury. It was the beginning of harvest, and the shocks of wheat were piled up on one end of an oblong-shaped field. I duly selected my bower as in the spring, and kept watch towards the wood for the first

arrival. Soon a bird was seen making for the cut wheat, which I secured, and followed the tactics before mentioned. Presently several were seen to enter the tree above me, and as they flew to the wheat I despatched them one by one, sticking each bird in a feeding position at varying distances, some on the shocks and others on *terra firma*. This sort of sport went on all the morning, till I had bagged 20 couple, to the apparent delight of the farmer and his agricultural neighbours who participated in the spoil. Extreme caution is needed at the onset if a good haul is desired, for even the quist can be wary.

THE PIGEON AS A MESSENGER.

The pigeon family is one of the most widely distributed orders of birds, for, with the exception of the frigid zones, it is found throughout the entire globe, being most abundant, however, in Southern Asia, the Indian Archipelago, and North America. The genera are extremely numerous, and differ widely in their habits, some being arboreal and others terrestrial. But in one particular they all agree; they all possess an innate love of home—a love so strong that when removed from their habitation they will at once return, though the distance to be covered may be many miles.

At a very early period of the world's history this inbred homing tendency was noticed by man, and by him was taken advantage of to utilize the bird for the purpose of carrying messages. When this custom originated is lost in obscurity; but for many centuries pigeon-flying has been a favourite custom and pastime with various nations and, in England at the present day, it has now been a prolific source of gambling.

So far as we know Noah was the first to use the pigeon as a bearer of intelligence; but the first nation of whom we have any record as employing the bird as a messenger is the Greeks. By them it was used with great advantage, and the knowledge they had gained respecting it they

imparted to the Romans, who first utilised it as a message-bearer about B.C. 120. That it satisfactorily performed the office of courier may be inferred from the fact that nearly three-quarters of a century later it was employed by Julius Cæsar as a military messenger; and when Modena, or Mutina, where pigeon-flying is still carried on to a great extent, was besieged by Mark Antony, in 44 B.C., we read that Decimus Brutus, whilst shut up in the city frequently communicated with Consul Hertius by means of this bird. For centuries pigeons continued to be used as conveyers of intelligence, and about 500 years ago they formed part of a telegraphic system adopted by the Turks, who erected high towers at distances of thirty or forty miles apart. These were provided with pigeons, and sentinels stood constantly on the watch to secure the messages as the birds arrived, and to pass the intelligence on by means of others. The communication was written on a thin slip of paper, and enclosed in a very small gold box, almost as thin as the paper itself, suspended to the neck of the bird. The time of arrival and departure was marked at each successive tower, and, for greater security, a duplicate message was always despatched a couple of hours after the first.

Military men will see in this piece of ingenuity a similarity between this system and the cipher method of signalling messages in our day. The intelligence, however, was not invariably enclosed in a gold box, but was sometimes merely wrapped in paper, in which case, to prevent the bird being injured by damp, the legs of the bird were bathed in vinegar, with a view to keep them cool, so that there might be no settling to drink or wash on the way.

The light, active body and long wings render the pigeon peculiarly adapted for speed, and for very many years it remained the fleetest means of communication which the world possessed. As instances of its velocity, it may be mentioned that on November 22, 1819, thirty-two pigeons which had "homed" at Antwerp were liberated from

London at 7 a.m., and at noon the first bird reached its destination, having accomplished the distance of 210 miles in (allowing for difference of time) about four and three-quarter hours, or at the rate of something like 45 miles per hour—the speed of a railway train. A few years later fifty-six pigeons were brought over from Holland, and having been set free in London at 4.30 a.m., the swiftest bird traversed the distance of 300 miles at the rate of 50 miles per hour, the slowest doing it in $37\frac{1}{2}$ miles in the hour, on an average. But a much quicker flight than these is on record; for we find it chronicled that in 1842 a pigeon flew from Ballinasloe in Ireland to Castle Bernard, a distance of twenty-three Irish miles, in eleven minutes, which gives the almost incredible velocity of 160 English miles per hour, a speed nearly equal to that of the common swift, which is, without doubt, the fleetest of all birds. As a bearer of military despatches, the pigeon has long since given way to the mounted messenger, the railway, the telegraph, and the heliograph, and other methods of signalling, though up to within comparatively recent times it continued to be employed as a conveyer of general intelligence.

As already stated, pigeons have long since ceased to be employed as carriers of military intelligence, but within the past decade or so the war authorities of the chief European nations have given much consideration as to the advisableness of again utilising them for this purpose, as the fact that it was only by means of these birds that Paris received news from the outside world during the many weeks of the siege of 1870-71, set at rest all doubts as to the possibility of usefully employing these swift aerial messengers under certain conditions.

In our own country, the exigencies of climate—mist, fog, sea fret, &c., render the employment of the bird as a national resource out of the question. The country doctor and postmaster, in many different parts of these islands, however, find the “carrier” of great value.

The Skylark (*Alauda Arvensis*).

GENERIC characteristics: Upper parts light reddish-brown, the middle and upwards of each feather dark brown; a whitish-smeary streak above the eyes; throat white; neck and breast whitish; tinged with yellowish-red, and smeared with a darker brown; tail moderate. Average length seven and a quarter inches. The eggs are greyish, more than ordinarily speckled with dark grey and brown.

Many of the bygone poets have struck the lyre in these well-known lines:—

“Hark! hark! the lark at Heaven’s gate sings,
When Phœbus ’gins to rise.”

This universally known bird, which has charmed generations of our country folk from time immemorial, rich and poor, high and low, prince and peasant alike, is plentifully distributed over the whole of our islands from John O’Groat’s to the Lizard. In a country where the plough was little known, and the cultivation of to-day had not commenced, the localities of the skylark were in extensive ranges of pasture land. Grazing lands, however, are still its favourite range, and it is often found in large numbers where the upland sheep pastures commence.

In these localities, and among the grass ripe for hay, it forms its nest and rears its young. Many a time, when a boy, have I discovered the young larks, in their infancy, scattered about the long grass after the passage of the scythe. The reaping machine of modern days tells a

similar tale, viz., of the wholesale destruction of broods of this beautiful songster.

The male, it is said, sings the loudest during the period of incubation, perched on a small elevated clod, or rising above the spot with a rapid motion of the wings, and during ascent pouring forth that melody which has been so often the theme of our more homely poets, and is a marked illustration with all who describe the accessories to rural scenery.

The song is sustained for a considerable time without break or interruption, both during the ascent and after having attained its wished-for elevation, and also while remaining poised in the air, so high as frequently to be known only by its song faintly heard.

Some of the old naturalists speak of its total disappearance, the height being so great. I have never met with such an experience, for I have been able to descry the small speck at all times in the azure sky. It is quite true the speck has been at times almost infinitesimal.

There is a legend—very pretty truly to the child mind and imagination—that the bird soars so high and so near Paradise that it borrows its song, in its richness, from the angelic choirs.

It never perches on trees, but is entirely terrestrial, walking and running with facility and swiftness, and never has it recourse to hopping.

In its geographical range the skylark seems pretty generally and commonly distributed over Europe, decreasing to the northward, and there becoming migratory in winter.

I have noticed it as early as March the first, both on this island and the adjacent mainland, and it remains in full evidence till September, if fine.

Not only those in possession of souls poetic have been enraptured with the charming cadence of this prince of songsters, but the rough gold-diggers, the early pioneers of emigration to the Southern Cross, we are told, walked

many miles on the Sabbath to listen to the rich, full melody of an English lark, which a female emigrant had brought with her from the old country. These rough men begged to be allowed to come, week by week, to hear its song, which reminded them of the old associations of their youth in an English peasant home.

In the days of the early gold-mining, the Sabbath had no meaning for them, as the extension of the Missionary Society had not reached Australia, but to them the song of this bird was typical of all that made life happy in the old home, across the eleven thousand miles of ocean.

The Common Cuckoo (*Cuculus Canorus*).

FROM time immemorial this bird has excited extraordinary interest, not only with children, but wherever it is found people of all ages rejoice to hear its clear note in the spring. It is supposed to be the harbinger of sunny skies and bursting foliage, and it carries with it dear associations wherever it goes, while its great peculiarity of locating itself in the nests of other birds, and therein depositing its eggs, has created an interest and curiosity amongst naturalists and others beyond the usual limit.

Another peculiar phase is the indifference with which it regards these deposits, for it relegates, with entire confidence, the charge of its young to the alien. Situation has, apparently, nothing to do with it, for this custom is universal with this species of bird. Indeed, it has puzzled ornithologists and naturalists alike, through the ages. Its structure, food, and habits are not dissimilar to others of the migratory tribe, but its process of incubation remains a mystery. No doubt it might have been managed in the usual course, but there can be no doubt also that the departure from it has been so arranged as to fill up or complete some principle in the economy of this special tribe of birds, or, as an old writer puts it, "some link in the zoological chain which has not entered the mind of the curious in nature," and one would suggest that a probable means of discovering the bearings of this mysterious deviation would be to endeavour to connect it with analogous cases in the other branches, where the variety

of circumstances by which it would be developed might lead to something which would unlock the mystery.

Birds possessing this parasitical economy are exceedingly few in numbers.

It arrives in April, and immediately proclaims the fact to its mate. This is continued unremittingly until the breeding season has passed, the note gradually becoming hoarser and more indistinct as the season advances, and ultimately before their departure they are entirely mute.

July usually sees the last of them—the first migrants to leave our shores. The period of remaining in the British Isles appears to be limited to the time necessary for a selection of nest and laying the quota of eggs.

The bird is very generally distributed, and is found in districts of every character. In this respect it differs from the nightingale, which is very seldom heard in the mining districts of South Wales, although across the Bristol Channel, on the coasts of Somerset and Devon, it occurs frequently and regularly. In choosing its nest, it goes invariably for that of insectivorous birds, like itself, and caterpillars form its staple food, hence its partiality for lands of high pasture and moorland.

The plumage of the head, neck, breast, and upper parts is of a deep bluish-grey. The whole of the belly and remaining under parts, and auxiliary feathers white, with pretty distinct black bars. The quills are blackish-grey, the inner webs have white bars. Tail of a darker tint, blackish at the end. Feet, dark yellow. The sexes are much alike in coloration; so unlike the sea birds. But the most complete account of what was anciently known and believed of these singular birds is given by Pliny—an authority which most naturalists will accept. He says: "They alwaies lay in other bird's nests, and most of all in the stockdove's, commonly one egge and no more (which no other bird doth besides), and seldom twain. The reason why they would have other birds to sit upon their eggs and hatch them, is because they know how all birds hate them, for

even the very little birds are readie to war with them; for feare, therefore, that the whole race be utterly destroyed by the furie of others of the same kind, they make no nest of their owne (being otherwise timorous and feareful naturally of themselves), and so are forced by this craftie shift to avoid the danger. The titling (*Anthus pratensis*) therefore that sitteth, being thus deceived, hatcheth the egge, and bringeth up the chick of another bird. And this young cuckoo, being greedy by kind, beguiling the other young birds and intercepting the nest from them, groweth thereby fat and fair-liking, whereby it comes into special grace and favour with the dam of the rest and nurse to it. She joyeth to see so goodly a bird toward, and wonders at herselfe that she hath hatched and reared so trim a chick. The rest, which are her owne, indeed, she sets no store by, as if they were changelings, but in regard of that one counteth them all misbegotten, yea, and suffereth them to be eaten and devoured of the other even before her face; and this she doth so long, until the young cuckoo, being once fledged and readie to flie abroad, is so bold as to seize on the old titling and to eat her up."

Linnaeus, the German, repeats this story of the voracious appetite, and hence the strange, but—to the Germans—appropriate expression, "ungrateful as a cuckoo." It appears, however, physically impossible that the young cuckoo, whose bill is only adapted for providing a meal of soft caterpillars, could ever perpetrate this horrible crime, and it is suggested that a conglomeration of observations of other foreign birds' habits have given rise to this particular trait in this fledgeling. That the egg of the cuckoo is carried in its beak to the selected nest is indisputable, for the shooting of the bird in transit to a nest has revealed this fact, the egg having been invariably found not far from the dead bird. Speaking of its insatiable appetite, the writer, when a youth, endeavoured to rear a young cuckoo, and attended to it for some time, and such was its appetite that it never seemed to have enough. Yet it did not make any attempt to eat unless it

was fed. Its wild, outrageously wild, nature never forsook it. It would screech, and exhibit unmistakable signs of disgust at its captivity, and all attempts at pacification ended in the same way. It was, therefore, set free.

It is a curious phenomenon of nature, that the baby cuckoo is apparently endowed with strength and vigour far beyond that of the ordinary bird, and it has a marked propensity to rid the nest of other occupants. It endeavours to the utmost of its powers to bundle the real owners—or the progeny of the real owners—headlong from the nest, for a space of some ten or twelve days, after which time, if its herculean efforts are unavailing, it assumes a quiet attitude, and remains to all intents and purposes in perfect harmony with its neighbours. The very formation—deformity, perhaps, would be the better word—of its body, assists its will-power, for close anatomists concur in the opinion that it has an extraordinary hollow or depression between the shoulders, which in no small degree conduces to assist the young bird in working itself under the other young, and getting them on its shoulders, for the toppling over process, for which it is noted.

As I have already and previously intimated, we have not a very high opinion of the cuckoo as a musician, or vocalist, because he is monotonous until he becomes bilingual, and gargles, or crows, or croaks. Those persons who do not dwell constantly in the heart of the country are apt to think and chortle poetically of many rural sounds which we bucolics, or agrestics, adjure prosaically; but the present point is that the gargling of the cuckoo is synchronal with the closing of the principal act of the annual trouting drama. After the passing of the drake, both trout and trout-fishers take a rest of many bars' duration, and so we look back and review the recent circumstances.

The Woodcock (*Scolopax Rusticola*).

GENERAL markings: Back of the head barred transversely dusky; upper plumage mottled with chestnut, yellow, ash, and black; lower, reddish-yellow, with brown zigzag lines; quills barred on their outer web with rust-red and black; tail of twelve feathers, tipped above with grey, below with silvery white; bill, flesh-colour; feet, livid. Length, thirteen inches. Eggs, dirty yellow, blotched, and spotted with brown and grey.

The history of the woodcock as a visitor in the British Isles is briefly as follows: Woodcocks come to us from the south in autumn, the earliest being annually observed about the twentieth of October. On their first arrival they are generally found to be in bad condition; so weak, in fact, that one recollects many instances of flights having reached the coasts of Cornwall, only able to gain the land. Their condition at these times is one of extreme exhaustion, and they become the prey not only of the sportsman but are easily captured alive.

In the course of a very few days those that escape the fowler or prowler, very quickly recruit their strength, when they make their way inland. They have been known to settle even on the deck of a ship, at sea, in order to rest; or actually to alight for a few moments in the smooth water of a ship's wake. Their usual place of resort by day are woods and coppices in hilly districts, whither they repair for shelter and concealment.

Disliking cold, they select in preference the side of a valley which is least exposed to the wind; and though they

never perch on a branch they prefer the concealment offered by trees to that of any other covert. There, crouching under a holly, or among briars and thorns, they spend the day in inactivity, guarded from molestation by their stillness, and by the rich brown tint of their plumage, which can hardly be distinguished from dead leaves. Their large prominent bead-like eyes are alone likely to betray them; and this, it is said, is sometimes the case.

So conscious do they seem that their great security lies in concealment that they will remain motionless until a dog is almost on them, or until the beater reaches the very bush under which they are crouching. When at length roused, they start up with a whirr, winding and twisting through the overhanging boughs, and make for the nearest open place ahead; now, however, flying in almost a straight line, till discovering another convenient lurking-place, they descend suddenly, to be "marked" for another shot.

About twilight the woodcock awakens out of its lethargy, and repairs to its feeding-ground. Observation having shown that on these occasions it does not trouble itself to mount above the trees before it starts, but makes for the nearest clear place, in the wood, through which it gains the open country; fowlers were formerly in the habit of erecting in glades in the woods two high poles, from which was suspended a fine net. This was so placed as to hang across the course which the birds were likely to take, and when a cock flew against it the net was suddenly made to drop by the concealed fowler, and the bird caught, entangled in the meshes. Not many years ago, these nets were commonly employed in the woods, near the coast of the north of Devon, and they are still said to be in use on the Continent. The passages through which the birds flew were known by the name of "cockroads," and "cockshoots."

The localities which woodcocks most frequent are places which abound in earth worms, their favourite food. When the earth is frozen they repair to the sea, or near springs;

and now probably they are less select in their diet, feeding on any living animal matter that may fall in their way.

In March they change their quarters again, preparatory to quitting the country; hence it often happens that considerable numbers are seen at this season in places where none had been observed during the previous winter. They now have a call-note, though before they had been quite mute; it is said by some to resemble the syllables, "pitt-pitt-coor," by others to be very like the croak of a frog.

It is pleasing to be able to corroborate the testimony of many sporting estate owners and gamekeepers that the habits of the woodcock have gradually been undergoing a change to their advantage during the last decade or two. In short, "*Scolopax rusticola*" can no longer be described as an autumnal immigrant only, but as an acclimatised species likely to become a valuable asset of many English and Scottish estates where properly cared for.

In northern, eastern, and central districts it shows each season a greater inclination to linger into the spring; but, unfortunately for the sporting western counties, the rule seems to be more relaxed that the mass of immigrants pass on thitherward. I view as a matter of correction the opinion nowadays so frequently heard that there must be some change in climatic conditions to account for the growing attachment of these wanderers to our country. I, for one, am persuaded that the climate has nowise changed of late, but that woodcock are simply returning to their old home because of the encouragement given by estate-owners, gamekeepers and protectionists under a more merciful regime. There can hardly be any doubt that, with the help of the general press, more and more good work is being done to make their sojourn comfortable, hence the reason of so many broods reared on British soil.

Wise sportsmen have learnt that the "pound of flesh" is but a premature and a false gain. Moreover, high authority recognises as important that no woodcock should be shot after January has turned, since the birds commence pairing in February, and any persecution during the

second month of the year will sharply cause their departure. Hence the circular addressed by the Field Sports and Game Guild (with Lord Westbury as chairman) to the various committees of the Wild Birds' Protection Act under County Councils, calling attention to the unsatisfactory regulations with respect to woodcock and their eggs.

As considerable confusion arises out of the multiplicity of orders and the inconsistency of dates even in counties which adjoin, it is suggested that the Home Secretary be petitioned to cancel all orders now in force, and, for the simplifying of the law, make them uniform for general application throughout the whole of England and Wales. The mean fence-time hitherto existing may be said to extend from March 1st to August 31st; but February 1st or 2nd is the new date selected by the Field Sports and Game Guild, the protection to last until August 12th.

I have had several pairs of breeding woodcock under observation during recent years, and obtained records of others from game-preservers on estates where they have been absent before.

In a favourable season the pairing seems to be fully accomplished by the first week in March. The "nests" are made in fairly warm, unwatered thickets often near the base of the grouse moors, some being in larch woods, where the trees average 60ft. high, where the ground is at ordinary times hard and dry, and the nearest boring ground over a mile away. The nidus, or apology for a nest, is in all cases a slight hollow or scoop near or among decayed leaves, preference being shown, I think, for the "needles" of a pine or fir the worse for decay; but, at any rate, there is a tree in the immediate vicinity. The nidus is largely composed of local foliaceous matter, eke dry grass.

It is not surprising that I almost trod upon one of these "nests" quite accidentally one day, for gamekeepers have been known to miss the bird herself while squatting in the

undergrowth at their very feet. No bird sits closer or preserves better silence than the woodcock; her long bill of three inches being meanwhile depressed. It apparently needs a bit of special training to detect her, for she is in excellent harmony with the general tone of her surroundings. The protective colouring is noticeable in her wood-brown back and breast, and in various tinted mottlings which blend with dead leaves and the soil over which they are strewn. Reddish brown is overlaid with oval chestnut marks, and shades of buff melt into golden and silvery grey with purposeful but quiet magic. Usually the woodcock is betrayed by her luminous, convex, black-brown eye, which, at such times, is wide open in its proper place, singularly near the top of her poll; which orb, by its great brilliance and size, proclaims the bird to be of nocturnal habits. Says Butler: "For fools are known by looking wise, as men find woodcocks by their eyes."

There are three or four eggs to the clutch. These are creamy or stone-grey, with often faint violet-washed marks, and decided warm brown blotches at the larger end. By mid-April I have seen the nestling chicks, which are of a light buffish brown above, with dark chestnut stripe on the centre of the crown. This, although interrupted at the nape, is taken up again and carried down the back. There are similar though undecided transverse broad stripes, and the under parts become almost white.

These nidulants—one can hardly call them nestlings—"run away from home" almost immediately they are hatched, just like water-loving moorhens, coots, mallard, and other youngsters of the duck tribe. On one noteworthy occasion, however, I was just in time, along with a friend carrying a camera, to find a still plump mother-woodcock sitting as tightly as a tired newly-arrived immigrant will do in her determination to protect half a handful of her offspring in the transitional stage. We afterwards found that she retained charge of one chick, that a second had skedaddled, and that a third was chipping its shell. Close at hand were some fragments of a shell from

which a chick had quite recently been hatched. However, this mother-bird faced the camera with sufficient equanimity, and subsequently allowed Harry Lavender, the gamekeeper, to stroke her back. He went as far as to say that he would lift her off the ground and pretend to put her in his pocket; but this proposed outrage on the bird's confidence he failed to commit. She fled, but was sharply back again, to be welcomed by two nidulants and a half, which within a couple of hours became a full family complement of four, and several passable photos were secured.

Another maternal woodcock declined this outside familiarity. On being disturbed by two strangers she snatched up the chick nearest to her, and bore it off to a distance—right across the river in the valley, said our keeper. This chick's two fellow-mates simultaneously disappeared into cover, and did not emerge therefrom until called together by their parent, who, to our great satisfaction, brought back the other little one. I do not wish to suggest that behaviour of the kind is characteristic of the woodcock, which has surely never been seen carrying off a chick dangling at the end of her long bill. Lavender, the gamekeeper mentioned, says he has seen more than one youngster tucked privily away between the mother-bird's wonderfully fine thighs, and in such fashion deported to moist probing-grounds at a distance.

Since home-breeding woodcock are now more numerous, one would naturally expect to hear of more mature birds being bagged during the autumn and winter. I do not think it is so, because, unfortunately, a very great number of home-reared birds go away. The Duke of Northumberland, at Alnwick, has been very successful with the catching and marking of young birds, whose legs carry a small ring, marked "N," along with the year. Several have been shot at different points of the compass, but it has been shown that the majority proceeded north towards the end of summer.

Some countrymen will inform you that the woodcock is double-brooded, although they are not able to prove it.

Could others do so, I think it might be found that the first brood turned north, while the second brood turned south with other migrants at the appointed time. If the double brood be mythical, those unfledged birds which are often encountered in early autumn point to my sinister conclusion that the original clutch of eggs was either stolen or destroyed by vermin.

Mention is made of the scarcity of woodcock. A short time ago many of these birds rested in their aerial flight on the Farnes, and the two men, the sole occupants of those islands, had a lively time with the gun—so much so that they ran short of ammunition, one securing sixteen brace and the other seventeen. Since that shoot some visiting gentlemen have shot several of these birds from the cobbles. The Farne Islands offer varied and sensational sport, for oftentimes when birds are scarce one may get a shot at a basking seal. Four woodcock and a couple of seals fell to the lot of a gun from a small boat recently. The seals were of baby growth, scaling from four to seven stone. It is well known to Scotch naturalists that this animal attains a weight of seventy stone. It should be remembered that shooting parties can hire cobbles from either Seahouses or Holy Island for these excursions.

It is estimated that lighthouses on the Atlantic coast of the United States cause the destruction of about 100,000 birds annually. The birds, being attracted by the light, and flying against the glass, are dashed to pieces. The migratory birds are the chief sufferers, the havoc being great in April along the northern coasts, from Cape May to Maine, and in October on the Florida shores. At one lighthouse in Florida the lantern itself was broken by the repeated shocks from ducks, and an iron network had to be erected round the light. Even then the ducks struck the netting with such force as to break through it and smash the heavy outer plate-glass of the lantern. From twenty to fifty dead birds were often found in the morning.

A writer at Holy Island, who represents the Wild Fowling Association, mentions the fact, in corroboration of the

foregoing, that the ever-memorable Longstone Lighthouse has caused the destruction of many of the winged tribe in their migration flights. The flash of this light can be seen for fifteen miles, encompassing and protecting the twenty islets which form the Farne group. It is in winter no uncommon sight for the lighthouse keeper—still a Darling—to descry in the early morning several ducks with broken necks lying on the rocks close by. It is a common saying that "Longstone has a meal to-day." Some woodcock were recently found similarly killed, whilst many more have been shot by the daring visiting fowlers who made North Sunderland their rendezvous.

"The Scottish Field" says:—Some doubt has been recently expressed by writers who are generally well informed as to the nidification of the woodcock on Scottish soil. I had fancied that the fact had long been universally accepted that the long-billed bird nested and reared its broods in this country, but it would appear that a number of sceptics still exist. Mr. MacInroy has come forward and unequivocally stated that the nesting of woodcock in Scotland is quite common. Twenty-nine years ago he found the first nest, and as the years pass by such nests are encountered in ever-increasing numbers. For carrying out its domestic plans, the bird favours certain districts and avoids others. Many people believe that the woodcock produces two broods in the season, but on this point there is really no conclusive evidence. Unfledged birds have been found as early as the middle of April and as late as the end of August, but these irregularities may be accounted for in various ways. Young birds are often shot whenever the grouse season opens. Certain "sportsmen" have been known to make really large bags of young cock even on the Twelfth. Although the law permits the killing of the birds from the first day of August, it is a well-known fact that they are unfit either for shooting or eating until October. No true sportsman will endeavour to bag them earlier. If the birds are to be accorded an opportunity of gaining a firm foothold as

residents in this country the season for shooting them must be limited by law, and should begin, as in the case of the pheasant, on 1st October, and terminate on 1st February. I may remind sportsmen that on the Duke of Northumberland's estate of Hulme Abbey, Alnwick, woodcock have been marked every year since 1891, and a careful record is kept of all the marked birds afterwards discovered and shot.

Until recent years it was a common delusion that long billed birds, such as woodcock and snipe, lived by suction alone, though most upholders of this view would have found themselves at a loss if asked to explain how this could possibly be the case. What nourishment could be drawn from the ground by this means is hard to imagine, but the idea prevailed, and, though long since exploded, is not infrequently stated by ignorant people who wish to pose as ornithologists at the present day. It was possibly fostered by the uncertainty surrounding the movements and habits of these species, for in the rustic imagination "these 'ere foreigners" are credited with powers of which no resident species can boast.

Strictly speaking, the curlew should be classed with the longbills mentioned above, for their food is very similar, though the habits and movements of this "watch-dog of the moors" are peculiar to itself alone. Long-billed birds generally lay pointed eggs, and, with few exceptions, the nests are made on the ground, and the materials used in their formation are of the scantiest, consisting merely of dry grass, hay, and a few odd pieces of straw, rushes, etc. The curlew however, only lays two, or at most three, eggs, and it is exceedingly rare to find four in one clutch. The woodcock lays four, beautifully mottled with rich brown, while those of the snipe resemble the well-known eggs of the lapwing on a smaller scale, being, however, somewhat darker in shade. Woodcock often rear two broods, and it is not uncommon to find incubation still in progress at the beginning of August, especially when the spring has been accompanied by late frosts and snow.

The diet of woodcock and snipe is of a varied nature, consisting of insects, worms, and grubs of all descriptions, which are located by the long and sensitive bill in the soft ooze or marshes affected by the species at nightfall. On a moonlight night the birds may be seen probing diligently for their food, and the quantity thus obtained in favourable localities is best shown by the speed with which they recover from the effects of their long autumn flight.

Scandinavia is pre-eminently the home of the woodcock, though the species is distributed generally all over Northern Europe. The American species is totally distinct, and, so far as I am aware, has never found its way across the Atlantic. In the vast pinewoods of Norway it breeds in peace and security, though large numbers are caught for the market when gathering on the coast-line at the first breath of winter. There they may be seen in large parties, preparing for their autumn migration, and it is probable that only a small proportion find their way home again in the spring. Some travel as far as Spain and the shores of the Mediterranean, being guided solely by the instinct which prompts them to resort to milder climates at the approach of winter. Their sensitive bills are ill-fitted to penetrate frost-bound ground, and food, water, and shelter are indispensable for their existence.

Annually increasing numbers breed in the British Isles, and the growing popularity of covert-shooting has provided them with extensive plantations in all parts of the country where they may carry out their nesting operations undisturbed. The partiality of the species for young woods composed of larch and Scotch fir is well known, and the presence of a flight of 'cock lends an additional charm to a day in the coverts when longtails and longbills may both be expected.

Home-bred birds generally leave the coverts in which they were reared at an early date, and one would almost credit them with a knowledge that the close time expired on the first of August. The fact is, however, that the

woodcock resents disturbance, and in the islands on the west coast of Scotland it is commonly supposed that a longbill which has once heard the whistle of the lead takes its departure on the following night. Certain it is that in this locality no beat should be worked twice on consecutive days under ordinary circumstances, and that at least three days should be allowed before it is shot over again. During severe weather, when the big flights arrive, this rule is hardly applicable, for fresh birds cross the narrow sea night after night, and take the places of those which have gone.

Sometimes, the first arrivals appear early in October, but only if driven from their northern haunts by stress of weather. These migrants arrive in an exhausted condition, especially if a change of wind has rendered their progress more laborious. A moonlight night is generally chosen for the crossing, with a strong wind blowing from the north-east to help them on their way. As a rule, the main flights appear on the east coast at the end of the last month in autumn and during the course of November, though a few stray parties may turn up any time before the end of January. After a short rest, varying in length according to the feed obtained in the place where the flight has pitched, they split up into small parties and scatter over the mainland till the advance of winter drives them further west to the coast-line and to the Emerald Isle.

Other flights have frequently been noticed during February on the west coast of Scotland, and these probably consist of birds returning from Ireland, which rest for a short period in Raasay, Skye, and elsewhere before finally crossing Scotland *en route* for their Norwegian home.

Woodcock, as already remarked, feed by night, and the state of the weather at daybreak offers a sure guide as to where they will be found during the following day, for, except during severe frost, they seldom feed during daylight, being, like others of their congeners, of a shy and retiring nature. Thus, after a stormy morning 'cock may be sought in the shelter of burns, pine and birch woods,

and, generally speaking, in the hollows below the wind. If the day has dawned quiet and peaceful, they may be seen anywhere in the open or in the shelter, wherever the fancy of each individual bird has led it after its meal. After a light night, 'cock sit close, having gorged themselves to such an extent that they may sometimes be caught by dogs or with the naked hand. After a stormy night they are wild, unsettled, rising like a snipe, and zig-zagging away with an uncertain and puzzling flight, while on other occasions they rise with slowly moving wings, flying like an owl when bewildered by the light of day. The large eyes of woodcock are sufficient to betray its night-feeding propensities, and it is this bright organ alone which enables the observer to locate the hen when sitting on her nest in dry leaves or dead bracken, which precisely match the colours of her plumage.

Generally speaking, woodcock lie facing the sun, and thick heather slopes, with a few birches scattered here and there, are favoured in such localities where food is plentiful in the neighbourhood. It stands to reason that a woodcock is unwilling to travel far after a full meal, just as so many human bipeds prefer the comfort of an armchair after dinner to a long cross-country walk. Hence they are often found near the feeding-grounds, even when frost has not driven them to the neighbourhood of water, although in the latter case it is far easier to predict with any certainty the spot chosen by the long-billed bird. Their habits are, however, very variable, and every sportsman will frequently find his pet theories upset by the elusive bird. Often we find them where least expected, and it is common indeed to see it rise close to our feet when both barrels have been uselessly expended on some furtive bunny dodging in the heather.

The migrations of snipe are more regular, and, though likewise affected by severe weather, their arrival can be foretold with greater accuracy. From the end of September till the beginning of December snipe appear in these islands, but, as regards their habits, the above

remarks about 'cock are to a great extent applicable. The same feeding-grounds are chosen, but whereas the woodcock prefers a dry bed during the day, the snipe still remains in the marshes, and rests on some tuft of rushes rising above the surface of the water. It is almost needless to state that snipe should, where possible, be walked up down-wind, except during frost, when the opposite manœuvre will be found most successful. Snipe, like woodcock, are perfectly equipped by nature for their mode of life, and can best be studied in their natural surroundings—far from Kensington or other abodes of stuffed specimens.

The Woodcock.

By the late Captain Horace Townshend.

Of all the birds from over the sea
Who flock when the cold north wind blows free,
I hold the woodcock to be the king,
With full bright eyes and brown, bent wing.
Silently flitting across the ride,
Sweeping—a flash—down the mountain side,
Hiding beneath the holly tree,
The brave old 'cock is the bird for me.

The lord of the acres may boast his stock,
The well-fed tribe of his pheasant flock;
But can he whistle or can he bring
At his call the bird of the brown, bent wing?
He knoweth little of keeper's care;
His home is the moorland, bleak and bare,
And the sheltered glen where the holly tree
Just kisses the wild brook lovingly.

Where the moss-clad rocks rise round the spring,
Veiled by the ferns thick clustering,
With a small, bright peep of the sky o'erhead—
There was my wild bird born and bred,
A round little lump of dusky down.
That will change at last to these feathers brown,
When he flies to his haunt by the holly tree
And the brook that ripples unceasingly.

The winds of winter fiercely blow;
He findeth shelter enough below;
The briars tangled, yellow and red,
The tall trees swaying overhead.
But the end must come, though all seems fair.
A sharp crack rings through the frosty air,
And, with dulling eye by the holly tree,
He lies, once king of that woodland free.

Marking of Woodcock in Northumberland.

Hulne Abbey, Alnwick.

June 8, 1910.

Sir,—In reply to your letter *re* marking of birds, I beg to say that the woodcock is the only bird that we mark, which we have done since 1891. I have records of our birds having been shot in England—several counties—Ireland, Scotland, and Wales. Also one in France. I am sending you on *Shooting Times* of May 21, in which you will find an article on our marking, as follows. If you wish I can forward on my book, in which I keep a record of all marked birds, and where shot.

Yours obediently,

W. MEECH.

W. Halliday, Esq.

A RECENT note in the *Shooting Times* makes reference to the nesting of woodcock in many parts of Great Britain, and a query which happens to bear on exactly the same subject is sent by a correspondent, whose letter was published in the same issue. This letter has already been answered, the inquirer being informed that the woodcock shot by his friend undoubtedly was one of those marked by the keepers on the Duke of Northumberland's estate at Alnwick. Probably there are a good many readers of this paper who would like to hear more as to these experiments with the woodcock bred at Alnwick, the marking of which is carried out in order to

discover as far as possible the movements of the British-bred 'cock.

As stated in the note referred to above, there is, of course, no longer any doubt as to the more or less common occurrence of the woodcock as a breeding species in these islands, but very little so far has been discovered as to what becomes of these birds, for, although there would seem to be no longer any diminution in the number of woodcock killed each season in this country, the increase that might well be expected from the greater plenty of nesting birds has not yet made itself manifest.

It is true, of course, that in those districts in which woodcock now breed somewhat extensively rather heavier bags than formerly are obtainable each season, but the increase is not in any way proportionate to the larger number bred; in fact, it is known in one or two cases that the proportion is very much smaller than might have been reasonably anticipated. The woodcock in a certain district are, we will say, increasing, so far as nesting goes, at the rate of 25 per cent. per annum, but the bags obtained do not represent anything larger than an addition of some 5 per cent. The obvious inference is that the remainder of the birds go off to other districts, but even this does not take into account the possibility that the larger total of birds killed may be represented to some extent by a slight increase in foreign visitors coming in the autumn.

Seeing that upon the evidence collected it is plain enough that the woodcock bred in any particular locality distribute themselves somewhat widely, the question then arises: Where do they go to? So far the answer to this query is only partially answered, and it is still contended by certain recognised authorities—men who have taken great pains to discover the solution of this interesting problem—that home-bred woodcock do not go so far afield as might be supposed. Mr. Charles Dixon, for instance, writing in that fine work of his, "The Game-birds and Wild Fowl of the British Islands," says:—

"Speaking from a naturalist's point of view, and with

a full knowledge of the habits of birds during the moulting season, I should say emphatically that the woodcock breeding in the British Islands are stationary; that is, in the sense of not crossing the seas. I am glad to say that this opinion is confirmed by several intelligent game-keepers, on whose grounds the bird breeds in fair numbers every season."

Now, of course, unless these birds are marked it is impossible to say what may become of them, for it is freely admitted that it is not very easy to distinguish a foreign-bred woodcock from one that is hatched in these islands, nor is it at all easy to state the age of any woodcock. Moreover, the experiments at Alnwick go to show that some, at least, of the woodcock bred there do go a long distance from their home, although it seems more than probable that many of them return in after years to their original home. Many of the birds bred at Alnwick have been killed there some years after they were marked, but that must not be taken as conclusive evidence that they have never been far away. It may be conceded, perhaps, that when a woodcock is killed at home in the same year that it was bred, or even at any time during the following shooting season, it has never been far away, but even here we are jumping to a conclusion without being able to substantiate it.

By way of illustrating the fact that many home-bred woodcock do travel very far from home, and that a certain proportion of them do actually cross the sea at some time or other, it may be as well to instance some of the cases that have cropped up in the course of the Alnwick experiments, which have now extended over a period of twenty seasons. We will take first those that were killed in the shooting season following their being marked—that is, within a year of hatching. The first example of this occurred in December, 1897, when a bird of the year was killed in Co. Wexford, Ireland. In the year following a bird of that season's hatching was secured in Co. Cork, and further instances, no doubt, have occurred, though they have not been reported up to the present.

Several woodcock from Alnwick have been killed in Ireland some time after their first season, as the following instances will show: One marked in 1902 was shot on the Dunmanay Mountains, Co. Cork, in March, 1903; another, marked in 1903, was killed on the Castle Townshend estate, in the same county, on January 8, 1907; and another, marked in 1905, was secured at Carass, Croom, Co. Limerick, on November 21, 1906. The best illustration of all, however, is supplied by the bird killed in Brittany, in the Commune of Glomel, near Rostrenen, Cotes du Nord, in November, 1907. This bird was marked in 1905, and its identity was proved beyond a doubt, the ring round its leg being sent home by the Vicomte de Foulavoir, who vouched for the accuracy of the particulars given. It may safely be concluded from this last instance, that home-bred woodcock are, on occasion, as much given to wandering as any of the birds that pay a visit to Great Britain in the autumn, and it is likely that for one woodcock killed and identified there are a dozen others that either escape altogether or are not reported.

So far as they go, the Alnwick experiments are intensely interesting, but one must be careful not to draw hasty, and possibly incorrect, conclusions from them. They may mean a great deal, or, upon the other hand, they may not be so conclusive as they seem. And this is because, owing to the nature of the marking, the endeavour cannot be regarded as quite complete. The birds are marked with a soft metal ring, upon which is simply stamped the initial "N," followed by the year of marking. Now, to the stranger, and especially to the foreigner, these marks are not very intelligible, and it is more than likely that out of every dozen woodcock thus marked that might be discovered by gunners in various parts of this or any other country, not three would be reported to the proper quarter. Some of those who shoot birds with these mysterious markings might not deem it worth while to take the trouble to report; others, like the friend of the *Shooting Times* correspondent referred to, would have no notion what the

marks might mean, while it is at least conceivable that a proportion of these marked birds that find their way into somebody's bag are not even noticed. A case of the latter kind was reported not long ago, the writer stating that it was not until the bag was spread out for admiration at the end of the day that someone noticed one of the woodcock had a ring round its leg.

It is only to be expected that the larger number of woodcock marked on any estate are likely to be killed at or near home, and this has proved to be the case in the experiments conducted at Alnwick. But this does not prove that the birds are chiefly of a stay-at-home disposition. In the immediate neighbourhood of the place where the marking was carried out, it would be fairly well known that such a system was extant, and every keeper or gunner who shot a woodcock would examine it closely to see whether it was a marked bird or not. In places further afield the fact of a marked woodcock being shot might be talked about locally, and possibly someone might communicate the circumstance to the local paper, but there, very probably, the whole thing might end, unless someone who happened to know all about the marking chanced to hear about it.

For all these reasons it is to be hoped that in future bird-marking experiments a more comprehensible plan will be adopted, so that whenever a bird is found it may be possible for the finder to get into communication with the marker. In regard to birds in general a system of this kind has been practised for the last year or two by the editors of the journal, *British Birds*, the name of one of the editors, followed by his London address, being stamped on even the smallest rings. This system leaves nothing to be desired, for everyone knows where London is, and as each ring has a distinctive number the mere return of it to its original source is sufficient to trace the person by whom it was affixed, the kind of bird to which it was attached, and the date of marking, all these particulars being registered in the first instance. It is greatly

to be hoped that in all cases of woodcock-marking in the future this excellent system will be followed.

In a paper on "The Cleverness of the Woodcock," the writer combats the assertion that the woodcock is "stupid" (having in mind, possibly, the French saying, "*Bete comme un becasse*"), and among other illustrations of his point he states that "though a 'cock may flap away in seeming hopelessness, a sportsman should not allow himself to be deceived into thinking that the shot is necessarily easy. The very appearance of hopelessness may be a trick, and at the moment when the trigger is pulled a twist and swerve will come from those powerful wings that will fling the little body far outside the shot's pattern—'fling,' for that expresses just what these wings and what the 'cock's strong thighs and legs can do to win its safety."

The Golden Plover (*Charadrius Pluvialis*).

GENERIC markings.—In winter: Upper plumage dusky, spotted with yellow, cheeks, neck and breast mottled with ash-brown and buff; throat and abdomen white; quills dusky, white along the shafts towards the end; beak dusky, feet deep ash-colour; irides brown. Summer: Upper plumage greyish-black, spotted with bright yellow; forehead and space above the eyes, white; sides of the neck white, mottled with black and yellow; lore, throat, neck, and lower parts, deep black. Length, nine inches. Eggs, yellowish-green, blotched, and spotted with black.

The Golden Plover is a common bird in the south of England during the winter months, and it is also liberally distributed in the Midlands and in the North, especially on the coastings; also in the mountainous parts of Scotland. Many of this species are found on the Northumbrian coast from early October right away to the beginning of March, and the flesh of this bird is highly prized by sportsmen.

Its habits and plumage are so different at the extremes of winter and summer that the young naturalist who has had no opportunities of observing them in their transition stage, and has had no access to trustworthy books or notes might be forgiven for setting down the two forms of the bird as distinct species.

In the hilly districts of the north of Europe, golden plovers are numerous, sometimes being, with ptarmigans, the only birds which relieve the solitude of the desolate

wastes. Though numerous in the same localities, they are not gregarious during spring and summer, and are remarkable for their extreme fearlessness of man. So tame, indeed, are they, that in little frequented places, when disturbed by the traveller they will run along the stony ground a few yards in front of him, then fly a few yards, then stand and stare and run as before. On such occasions they frequently utter their singular cry—the note so often referred to in Sir Walter Scott's poems—which, like the nightingale's song, is considered simply plaintive or painfully woe-begone, according to the natural temperament or occasional mood of the hearer.

This bird builds no nest; a natural depression in the ground, unprotected by bush, heather, or rock, serves its purpose, and here the female lays four eggs, much pointed at one end, and arranges them in accordance with this. At the approach of autumn, no matter where their summer may have been passed, plovers migrate southwards in large flights, those from Scotland to the southern counties of England, where they frequent wide moist pastures, heaths, and re-claimed marsh-land.

From the northern parts of the Continent of Europe they take their departure in October, either to the European shores of the Mediterranean or to the plains of Northern Africa. In these migrations they are not unfrequently joined by starlings.

They travel in close array, forming large flocks much wider than deep, moving their sharp wings rapidly, and making a whizzing sound which may be heard a long way off. Now and then, as if actuated by a single impulse, they sweep towards the ground, suddenly alter the direction of their flight, then wheel upwards with the regularity of a machine, and either alight or pursue their onward course. This habit of skimming along the ground and announcing their approach beforehand is turned to good purpose by the bird-catcher, who imitates their note, attracts the whole flight to sweep down into his neighbourhood, and captures them in his net, a hundred at a time,

or, when they are within range, has no difficulty in killing from twelve to twenty at a shot. Not unfrequently, too, when some members of a flock have been killed or wounded, the remainder, before they remove out of danger, wheel round and sweep just over the heads of their ill-fated companions, as if for the purpose of inquiring the reason why they have deserted the party, or of alluring them to join it once more.

This habit is not peculiar to plovers, but may be noticed in the case of several of the seaside waders, as Dunlins and Sanderlings.

In severe winter weather they desert the meadows, in which the worms have descended into the ground, beyond the reach of frost, and so of their bills, and resort to the muddy or sandy sea-shore. In the Hebrides it is said that they do not migrate at all, but simply content themselves with shifting from the moors to the shore and back again, according to the weather.

In the northern parts of France, on the other hand, they are only known as passengers on their way to the south. From making their appearance in the rainy season they are often called "pluviers," whence our name plover, which, however, is supposed by some to have been given to them for their indicating by their movements coming changes in the weather, in which respect indeed their skill is marvellous.

The Golden Plover, sometimes called also Yellow Plover, and Green Plover, is found at various seasons in most countries of Europe; but the golden plovers of Asia and America are considered to be different species.

An interesting duel between a plover and a magpie, and afterwards between the same plover and a terrier, was witnessed recently at Ponthis, near Newport. The plover, whose nest had been attacked by the magpie, defended it pluckily, at times literally screaming with rage, and the intruder being ultimately driven off. In the second contest a terrier wandered in the vicinity of the nest, but the plover swooped down and pecked viciously at its neck. The

startled animal, unaware of the source of attack, still wandered about, and the plover got in a second peck. This time the terrier saw the plover and jumped, but failed to catch it. The duel continued until the terrier, almost exhausted by the pluck and persistency of his opponent, gave up the unequal contest, and retreated from the field of battle.

The Quail (*Coturnix Communis*).

AS a subject of natural history this bird may be said to rank pre-eminent, as it has been conspicuously before the naturalist from the earliest times. In the early days of the Egyptian dynasty to the withdrawal of the Israelites from bondage, the quail figured largely as an item of diet, and in one instance we read that "they came up and covered the land."

"This species," says a French naturalist, "is probably the most productive of all winged creatures; and it could not well be otherwise, or it would be unable to withstand the war of extermination declared against it by human beings and birds of prey. One may get an idea of the prodigious number of victims which the passage or migration costs the species by the two well-known routes.

"There is a small islet, about the size of Holy Island, in the Bay of Naples called the Bishop of Capri, which used to clear a net revenue of 25,000 francs a year by its quails. This sum represents 160,000 birds at the most modest computation.

"In certain islands of the European Archipelago and parts of the coast of the Peloponnesian Islands, the inhabitants, men and women, have no other occupation during two months of the year than that of collecting the quails which are showered on them from Heaven, picking and cleaning them, salting them, and packing them away in casks for transportation to the principal markets of the Levant. That is to say, the migration of quails is to this part of Greece what the migration of herrings is to Holland and Scotland.

"The quail-catchers arrive at the shore a fortnight in

advance, and every man numbers his ground to avoid disputes. The bird arrives in France from Africa early in May, and takes its departure towards the end of August."

Another French author says: "Like rails, woodcocks, snipes, and many of the waders, the quail, when it travels towards the sea-shore, flies only in the night. It leaves the lands, where it has passed the day, about the dusk of the evening, and settles again with the dawn of the morning. Not unfrequently, while performing their transit, they become weary, and alight on vessels or fall into the sea, and are drowned."

"Being at a small town on the coast in the month of May," says M. Pellicot, "I saw some boats come in with ten or a dozen sharks. They were all opened before me, and there was not one which had not from eight to twelve quails in its body."

Enormous flights are annually observed at the spring and fall, after crossing an immense surface of sea, to take a brief repose in the islands of Malta, Sicily, Sardinia, Crete, in the kingdom of Naples, and about Constantinople, where, on these occasions, there is a general shooting match, which lasts two or three days. This occurs always in the autumn. The birds, starting from the Crimea about seven at night, and with a northerly wind, before dawn accomplish a passage of about sixty leagues in breadth, and alight on the southern shore to feed and repose. In the vernal season the direction of the flight is reversed, and they arrive in similar condition on the Russian coast. The same phenomena occur in Malta and other places.

On its arrival, the quail betakes itself to open plains and rich grassy meadows—very like the partridge in this respect—especially where the soil is calcareous, and naturally avoids woody countries. During the early part of summer it frequents corn fields, saintfoin, and lucerne. In September it is found in stubble and clover fields, and among the weeds growing in dry ponds, or it

finds shelter in any crops which may yet remain standing. In warm countries it resorts to vineyards, attracted, it is said, not so much by the grapes as by the numerous small snails with which the vines are infested; for the crops of the late birds are generally found filled with these molluscs.

In locomotion it makes more use of its feet than its wings, and when put up is never induced to perch on a tree. Its flight resembles in character that of the partridge, but it rarely flies far, and when it alights makes awkward attempts to conceal itself, but often fails, and may sometimes be captured with the hand.

In June or July the female lays from eight to fourteen eggs in a hole in the ground, and brings up her young without the assistance of the male.

Towards the end of August the old birds migrate southwards, and are followed by the young. Before the end of October all have disappeared, though instances have occurred of their being shot during winter, especially in seasons when the harvest has been a late one.

The flesh of the quail is considered a great delicacy, and many thousands are caught and imported to the London markets for the table. They are placed in low flat cages, scarcely exceeding in height the stature of the bird, for the reason that in confinement the birds, in their effort to escape, would beat themselves against the upper bars and destroy themselves. These are said to be all old males. Quails inhabit the Eastern Continent, from China—where they are said to be carried about in winter by the natives to keep their hands warm—to the British Isles.

With us they are nowhere plentiful, but are occasionally shot by sportsmen in most parts of the country. In cornfields, on the shores of Belfast Lough, in the north of Ireland, they are of frequent occurrence. In Palestine they still come up in the night and "cover the land."

II.

Says Mr. Harwood Brierley:—

Not long ago I came across an old "quailer" living on the borders of Hatfield Chace, Yorkshire. I had never seen any quail-pipes until he pulled a set out of an untidy drawer in his cottage, and I wanted to purchase these as a curiosity; but the old professional hand imagined he would want them again some time, arguing that new quail-pipes were no more use than new fiddles. To a waist-belt with a buckle were suspended three leather pipes, not unlike the teats of a cow, each with a mouthpiece like a whistle. Concealing himself with this instrument tied round his waist in a bared patch of high corn during the month of August, he squeezed the air out of No. 1 pipe, which yielded a comparatively loud whistle deceptive enough to challenge any he-quail within earshot. It would be that bird's instinct to run in the direction whence this vexatious sound proceeded, whereupon the old quailer would squeeze pipe No. 2, whose note simulated a retreating bird's confession, "I am funky and will not fight." The third whistle impelled the oncoming dupe, and he, with bosom in a ferment of blended pugnacity and amorosness, rushed blindly into the net spread at the quailer's feet.

To Yorkshire naturalists, sportsmen, and epicures the quail is just now an interesting study. Perhaps no other bird has formed the basis of so much speculation on the subject of migration. No bird is, perhaps, so world-wide in its distribution; none so apt to go to extremes as constituting a plague which cometh in the night, or making itself strictly "conspicuous by its absence." Its movements seem all the more remarkable because it is included in the British game list, and related to the grouse and partridge, two birds which are indigenous to these islands, but do not migrate. The "common" quail (*Coturnix communis*) is not so common nowadays even in

Ireland—its favourite haunt in these islands—while in Scotland it is virtually unknown; but there are other species which pass as “rara avis” in Europe. All alike are distinguished from grouse and partridge by their entirely feathered heads, their straighter and more pointed wings, and shorter tail. “Coturnix,” the smallest of our highly prized game-birds, measures seven to eight inches. His upper parts are variegated with reddish-grey and brownish-black, marked with white bands, of which there are three on the head, the male having a dark brown and the female a yellowish-grey throat.

The name “quail” appears to come from the old French “quaille,” now written “caille,” or in Italian “quaglia,” in German “wachtel,” and in Danish “kwakkel.” To my mind, the suggestion that the origin of these names is onomatopæic, like “cuckoo,” “curlew,” “peewit,” &c., is not worth serious consideration. Nor is its cry so querulous as to suggest that “quail” comes from the Anglo-Saxon “cwelan” or Danish “quelen,” meaning to lose heart or give way before difficulty or danger. Although of most retiring habits during the breeding season, our partridge in miniature is a strong-winged migrant, with plenty of fat to subsist upon during privation, and a hot-blooded gamester ready to fight a round or two with any other quail who interferes with his wooing. In the corn crops he is an artful dodger, and only “quails” at the sound of an unexpected footstep which denotes the nearness, say, of some crack shot.

Our stock of information about *Coturnix communis* is rather meagre. We know him as a summer visitant from the arid parts of Africa, from the far Soudan, and the hinterland of Algeria. In Palestine enormous flocks of migrants arrive during March and April nights, and literally blacken—or brown—over the land, these being the same species which were brought to the camp of the Israelites. Long ago the common quail was dedicated to the Egyptian goddess of fertility, Astarte. He is known in India, China, Greece, Italy, Germany, France, and

Denmark, often in such vast numbers as to defy calculation. Millions and millions again cross the Mediterranean Sea. They are netted wholesale in many countries on their spring migration from Africa, the first great catches being male birds, which the experts take easily by simulating the call of the females.

Some of the Central European Powers have at different times intervened to protect quails during the breeding season. Great numbers are, however, still shipped from France, from Mediterranean and Adriatic ports, and even from the Grecian Archipelago, in defiance of a statute which penalises any person found in possession of live birds scheduled for protection during the breeding season. Only in July, last year, I saw a report in the newspapers that 30,000 quails, valued at over £1,500, were burnt to death in the aviary of a large dealer at Wood Green, London, where they were being fattened for market on hemp-seed, millet, &c. If there were the least likelihood of quails ever becoming exterminated by a world-wide traffic in them, it would not need an international convention of ornithologists to put the machinery of the law in operation. If the British Customs House officers were to receive instructions to report for prosecution such owners and masters of ocean and Channel steamers as had live quail on board, a system of cold storage would probably be initiated forthwith. Personally I do not see the necessity of enforcing the law as to the keeping of such so-called British game-birds as quails in captivity during the breeding season when they are known to be imported, for not only are they as proverbially numerous as the sands of the desert, but they are in high demand in all countries as an article of food. In "*Troilus and Cressida*," that "honest fellow enough, and one that likes quails," was no bad judge of flesh; he must surely have been an epicure. At the Cawood Castle banquet given by Archbishop Neville of York in 1466, a hundred dozen "quayles" were provided; and Earl Percy's house-book for as early as 1512 shows that no feast was ever held at Wressell and Leconfield

Castles without a great number of fat "quayles" appearing on the table.

From a naturalist's and a sportsman's point of view, it is much to be regretted that so few quail reach the English and Irish shores nowadays for the purpose of breeding. They have always been more abundant in Ireland than in England. A very limited number are seen each year in Norfolk, Lincolnshire, and Yorkshire, but rarely further north. Though preferring sandy ground where rye is grown, and disdaining damp clay soils, the quail has yet been reported as breeding some years since in the vicinity of Yorkshire's busiest towns. A pair was seen in the vicarage gardens at Danby-in-Cleveland in Canon Atkinson's time. A nest containing eleven eggs was found on a railway embankment in East Yorkshire in July, 1870. More recently a few have been seen in Holderness.

The Cassowary.

THE Cassowary is a flightless Australian bird belonging to the ostrich family, and in weight and strength priority is given to the female. Nature is accountable for many and various freaks, but the foremost is the fact that there are birds which do not possess the power of flight.

We find good examples amongst the penguins and ostriches, the wings of the former being transformed into paddles for swimming purposes, covered only with small scale-like feathers, the quills being quite rudimentary; while in the latter bird the wings are so reduced in size as to be altogether useless for the purposes of flight. Indeed, in some cases they are so rudimentary as to be completely hidden from sight by the feathers on the back and sides.

There are about twenty different kinds of penguins, and all are inhabitants of the Southern Hemisphere, amidst the ice of the Antarctic, in South Africa, South America, Australia, and New Zealand, whilst they vary in size from the large Emperor penguin, which measures 3ft. 6in. in height and weighs about 80lb., to the little blue penguin, which stands only about 16in. in height. All, however, are very similar both in appearance and in habits.

The ostrich birds may be divided into ostriches, rheas, emus, cassowaries, and kiwis (*Apteryx*). The first-named is now found in Africa, Syria, Arabia, and Mesopotamia only, although it is believed formerly to have inhabited parts of Central Asia. The rhea, or South American ostrich, is a very much smaller bird, and differs from its African relative in many ways, one of the most remarkable points being that it possesses three toes on each foot,

whereas the common ostrich has only two, and these toes are furnished with claws instead of nails. Unlike the bird in Africa, the rheas have feathers on their heads and necks, but they have no tails. Both kinds of bird use their wings when running at their highest speed, which latter is altogether remarkable.

The emus and cassowaries are from the Australian region, and they differ from the ostriches in many points. Especially are their eggs distinct from those of the ostrich. They are dark green in colour, and have rough shells, instead of being smooth, light-coloured eggs. In this group of birds the females are larger than the males, the latter not only doing the whole of the hatching, which lasts from eight to nine weeks, but taking entire charge of the chickens as well. Emus are now so common in Great Britain, where large numbers of them are kept in private parks and other places, that it is unnecessary to describe them, but they are rapidly being exterminated in the Australian region, and it is fortunate that they so readily adapt themselves to the vagaries of our extraordinary climate.

The cassowaries may generally be recognised at once by the helmet-like prominence on the top of their heads, and also, in some instances, by the heavy wattles hanging from their necks. Their feathers are hair-like in texture, and quite different in this respect from those of the majority of birds, whilst the wings are represented, externally, only by four or five black quills, which look like coarse bristles.

Both emus and cassowaries are three-toed birds, and they defend themselves by powerful kicks from their sturdy legs; but it is curious to notice that whilst the former always kick outwards and backwards, the cassowaries invariably kick forwards, raising up their heads and bodies to their full height at the same time.

But of all the flightless birds, the kiwi or apteryx of New Zealand is the most remarkable in appearance, habits, and structure. The rounded body without a sign externally of

wings or tail, the hair-like texture of the feathers, the lengthy beak with the nostrils placed at the end of it (in this respect being absolutely unique), the huge egg which it lays, so out of all proportion to the size of the kiwi that it is impossible to replace it in the skeleton of the bird which laid it without breaking some of the bones; surely here we see a regular triumph amongst Nature's freaks. They are night birds and strongly resent the daylight, the consequence being that if disturbed they protest by loud hisses, whilst if touched will strike out vigorously with their strong feet, and quickly draw blood where the claws get home.

The Ostrich.

THE ostrich is hunted in many picturesque ways, some of which I shall attempt to describe; but first let us talk a moment about this giant flightless bird that is not inaptly called the Giraffe of the Sahara. It is but recently that in the English possessions along the Guinea coast of Africa an ostrich was captured whose height was over nine feet. Surely the captors of this colossal plume-bearer may boast that they did not return from a fruitless errand! This phenomenal creature was shipped to England, and presented to the King.

The rough, bare feet, an enormous body which sways like a ship, a long neck which lifts itself with the undulations of a serpent, a hungry beak of reptilian form, which snaps together with the click of a lock, a bald, flat pate that defies the insulations of the desert wastes, eyes that glisten with vivacity and a cunning that the ambuscade of the hunter can hardly deceive, and that are untroubled by the sands and mirages of the desert, muscles of steel, incredible agility, untiring energy, a stomach of leather, and—of all its attributes perhaps the most remarkable—its fantastic awkwardness of gait and bearing, with its hesitant steps and automaton-like movements of its joints, give it the appearance of some huge product of a Nuremberg factory of toys.

The ostrich does not fly, but with its feet, that are ready at all times in self-defence, it measures untiringly the leagues of the sanded plains. Its country is Africa, its Eden the Sahara, its range immensity itself, its refuge the horizon, its carpet the burning sand. Its victory is in flight, in which it distances and wearies the Arab cavalier;

he espies it, dashes towards it, presses it close, and then—it disappears.

The ostrich delights in the heat of the sun, and makes of the sand its cradle and its tomb; but it is at night that it is most active, that it hides its great eggs in the sand, where, on account of their thick shells, they remain fresh, perhaps for a month, before incubation.

Yet, in spite of its colossal size, the ostrich is but a pullet in comparison with the *Epiornis*, that bird of past ages that was of a stature of 20 feet, and whose prodigious fossil eggs, rarely seen in our museums, were seven times greater than those of the ostrich of this epoch, as large as 150 eggs of the hen, or 50,000 of the oiseau-mouche. With a single egg of the *Epiornis* one might prepare an omelette for a hundred men.

We know that ostrich plumes have for all time been staple articles of commerce, needing first to be washed, tinted, and curled, when they are often worth 20 dollars for the best specimens.

Let us now consider the different methods of hunting the ostrich. In the Soudan the Arab employs a plan of his own, and an interesting one. The ostrich has a penchant for geometry, and what we may consider a fatal aptitude, tracing in its flight vast circles, the regularity of which is often the cause of its capture or death. While it is being pursued by some of the hunters, others lie motionless for a time, until with wild cries they launch themselves in a mad rush in a direction at right angles to the course of the bird, like a flashing of sunlit weapons across its path. It is then that the ostrich, confused, hesitating and terrified, becomes a victim of its own precision; but it does not yield without a struggle, and as the spears of its assailants draw near it threatens with its actively-moving feet the hunters, who are often injured by the clouds of stones and gravel thrown into their faces in its efforts at defence. It defends also with desperate bravery its precious eggs and its plumes so proudly worn upon its shoulders like epaulets.

In South Africa the ostrich is taken in another way by a singular and amusing stratagem. The hunter dresses himself in the skin of an ostrich, perfect in plumage, and with the neck and head held aloft by a slender rod; in this accoutrement, which also hides a carbine, the hunter approaches his quarry, perhaps a troop of many birds. At sight of the stranger the whole bunch hastens to inspect him, and is received with bullets instead of other welcome; the skin is cast off, and the deception is disclosed too late for their good. It is not always the feather that makes the bird.

The ostrich is the wealth of the Somali country of the eastern coast, where the natives capture the birds, not to kill them, but to rob them of their plumes, employing a curious ingenuity. In the pathway of the ostrich the hunter scatters small gourds, of which it is very fond, and then awaits results. The bird greedily swallows the doctored fruit, and if successful in getting more than its share becomes so stupefied that it is soon lying upon the sand with feet tied together and entirely helpless. Deprived of its priceless feathers, it is then released, to grow another crop for the year to come. It is more like harvesting than hunting, as when the people of the north capture and pluck the eider-ducks for their down.

It is well known that ostriches have a remarkable habit of dancing, in which they seem to find great pleasure. With the rising of the sun they begin, in close groups, a regular swinging step, as if engaged in an awkward imitation of the waltz. Presently the step is quickened, and the movement accelerated, until the huge birds, crowding together with wildly swaying heads and necks, whirling madly in a maelstrom of motion erratic to the last degree, are as if caught in the maddened rush of a cyclone's power. Not infrequently in these dances some of the birds suffer the breaking of their limbs, paying thus the fatal penalty of their reckless passion for this strange amusement. It is known that the habit of dancing in the solitary desert wastes of Africa costs the lives of 10 per

cent. of their numbers, for an ostrich with a broken tibia is under the sentence of death.

Almost as interesting as the dancing of the untamed creatures upon the sands of the Sahara are the ostrich races of the Somalis, the swift riders of the desert, equally trained in the use of the horse and the dromedary. In these races we see them also proudly seated on the backs of their strange mounts, showing their skill in what may hardly be correctly termed equestrian exploits. Before the assembled tribes, the ostriches, in groups, with the riders selected by the chiefs, nervously await the signal at which each warrior as if by magic seats himself upon the back of the chosen bird, as surely and silently as a monkey swings from tree to tree. Once mounted, they retain their positions by miracles of agility and address—vain and happy before admiring eyes, and their faces lit up with smiles. The ostriches, sharing in the excitement, break into a run, scouring the level wastes with the swiftness of the Arab horse, and answering the wildly screaming voices of the multitudes by frantic bursts of speed. In a moment, it seems, the excitement dies away; the fantastic rush of black-faced horsemen, whose glittering eyes scintillate, and whose white teeth gleam in the sunlight behind the mast-like necks of the colossal birds, passing as in a dream of disordered sleep, leaves behind as an evidence of reality only the far-off and fading cries of the yelling champions of the tribe.

AN OSTRICH FARM.

The ostrich farm is situated on the desert, about eight miles from Cairo. It consists of the house of the manager and the collection of pens or paddocks in which the ostriches live to produce feathers for ladies, who in many respects are more bird-witted and less wise than the ostriches themselves. The enclosures, in which are at the present time, 1,100 birds, are not roofed, because the warm

and practically rainless climate of Egypt renders this unnecessary. They are of two sizes. One is the sort of common room, in which young and unmarried male and female ostriches to the number of from ten to twenty live together. The other kind of enclosure is much smaller, and is reserved for one male and one female bird when, at five years of age, they show signs of desiring to set up house for themselves. In the sand floor of this house the cock scrapes a shallow hole and invites the hen to lay in it her eggs, which she does until they number about a dozen.

Men husbands might learn a lesson from the fact that the ostrich shares all its domestic duties with his wife except that of laying eggs. Both birds sit in turn on the eggs, relieving each other every three hours as punctually as if they wore the best watches. It is amusing to see the husband walking up and down waiting anxiously, or at least conscientiously, for the time to come for him to take his seat on what in Egypt must be almost as warm as a domestic hearth. In South Africa incubators are used, but not at the Egyptian ostrich farm. Here it is found that the eggs are more productive when hatched by the birds themselves. "Them big fowl" (as the Irish attendant calls the ostriches) instinctively know whether or not an egg is fertile. If it is not, they turn it out of their nest, and no matter how often a man may replace it, he finds that it is put outside the nest again. Here is another illustration, for who knows better than Christ the productive members of His Church?

Those who often visit the ostrich farm near Cairo seem to find the number of baby ostriches the same, and that they are at similar stages of development each visit. Of course, they are different birds, but only their caretakers notice the difference in them. Baby ostriches are fluffy little things covered with down and small feathers. When the ostrich is six months old it has to give a harvest of feathers, which are black and white in the case of the male bird and grey in that of the female. Eight months after this, and each successive eight months, another crop

is ready to adorn the hat of a lady of Belgrave or a "lidy" of Whitechapel. There is no warrant in nature for girls and women wearing feathers at all, but it is particularly unnatural when hats are adorned with ostrich feathers of a green, red, or other colour not worn by the bird.

In South Africa the feathers are cut off the birds; at the Egyptian farms they are plucked. I was told that the latter operation did not hurt; but any of my readers who have been plucked in an examination will doubt the statement. Plucking cannot give an ostrich much pleasure when it requires six men with ropes to hold him while it is being done. The small feathers that fall off themselves are collected, sewn together, and made into boas. A lady once remarked to me that an ostrich looks foolish from top to bottom, but in reality the bird is no fool. It is generally believed that when pursued he hides his head in the sand, and imagines that the danger has ceased because it is no longer seen. Politicians and ecclesiastics often shut their eyes in this way, but not so the ostrich. Those who, like my friends at the ostrich farm, have to catch him occasionally for plucking or other purposes know that he is by no means the foolish, cowardly bird the maker of metaphors would have us believe. The ostrich cannot be said to give more kicks than halfpennies, for his feathers bring in much money, but he certainly can give a terrible kick. One of the men at the farm was nearly killed by one lately.

What is the food that nourishes the ostrich and its lovely feathers at the Cairo farm? It is given from 2lb. to 8lb. of beans and bran daily, besides an allowance of clover. The years of an ostrich's life are about as many as those of a man—forty, sixty, eighty, or a hundred, according to the constitution of the bird and the sort of life it lives. From the earliest times as we learn from the paintings and reliefs in Egyptian tombs and temples, ostrich feathers were worn by Royalty, and symbolised truth and justice. How and why they were thought to represent these qualities I have not been able to find out, but I am sure that it

will be well for the girls who wear them if they feel under a greater obligation to be true and just in their dealings. The contents of one ostrich egg, our Arabian guide told us, would make an omelette for twelve persons. I thought I would give my share to the others.

The Merlin or Stone-Falcon.

MR. HARWOOD BRIERLEY says: "On many of our best stocked grouse moors of great extent the *Merlin* (*Falco æsalon*) is commoner than either sportsmen or gamekeepers suspect. I have never yet seen it figure on the gamekeeper's vermin-pole, but absence therefrom is no disproof of its presence on heathery fells and moors with steep ghylls where much common vermin is shot or trapped.

Although the merlin never seems to become abundant in any locality, it is nevertheless the principal winged poacher on certain moors I could name; and it is, in my opinion, the pluckiest, most dashing, and destructive of all birds of prey for its size, though I challenge a statement that it has caused even old grouse to succumb to terror and exhaustion. The ancient idea that a female merlin could have all her own way with grouse, partridges, plovers, starlings, larks, &c., is utterly fallacious. The smaller tiercel would probably starve if his living depended on hunting such birds, while his partner, too, has usually to work so hard for her living—losing many a skylark or meadow-pipit that she has singled out to make the object of pursuit—that often she is compelled to resort to sharp practices unbecoming a true falcon.

Long centuries ago the skylark and kindred breeds were allotted to the merlin as her special quarry, August being the month most favoured for sport, and the fair sex regarding her as their special "pocket falconette," for she is hardly larger than a thrush. As a trained pursuer of partridges, pigeons, plover, snipe, dunlin, &c., she has achieved some wonderful successes, being at any time

game enough to get on the track of birds far bigger than herself and bring them to earth.

Though frequently termed the "blue stone hawk," our merlin is, of course, a true falcon, as indicated by her pointed wings as long as her tail, the notch in the upper mandible of her beak, tubercle in the middle of each nostril, and dark brown eyes; whereas amongst the characteristics of hawks we shall find rounded wings shorter than the tail, "festooned" beaks, and yellow eyes.

For her size, the merlin has all the pluck of the peregrine, which species alone is flown to-day by the Old English Hawking Club at black-headed gulls and rooks. The great peregrine ascends to a considerable height above her quarry, seizing an opportunity to swoop to the same in full view of the mounted company below. The little merlin chases her quarry often far afield, and at a great rate, closely following every double, twist, and turn, but never far from the ground. Whilst both peregrine and merlin rely on superior wing-power and endurance in pursuit, the sparrow-hawk adopts manœuvres; we shall see her skimming over hill-top and hedge, beating bush and shrubbery, and coming round rocks on the fugitive unaware. The kestrel will "windhover" almost stationary awhile, then suddenly pounce down upon her quarry—generally a mouse on the ground.

In my moorland rambles with George Jeddle, a Yorkshire gamekeeper, the nesting merlin has been traced. Like other watchers of grouse moors, Jeddle wants to see the merlin exterminated, his young cheepers, which it cannot let alone, being of more importance than the welfare of the British Constitution. He vows vengeance against every one he sees and can hear tell of; he will stoop to smash the eggs, kill the "baregollies," and trap or shoot the adult birds.

The only consolation a keeper can have is that a radius of, perhaps, eight miles does not hold more than one merlin's nest, though it cannot be denied that a pair of birds, followed by their brood of four, will soon do a deal

of damage amongst grouse cheepers. Jeddle avows that he has seen a pair of merlins working together and quartering the ground like a brace of well-broken pointers. This is credible enough in the light of well-ascertained facts as to the bird's cunning and its audacity in attacking partridges, lapwings, golden plover, snipe, and other birds superior in size to itself.

Jeddle informs me that the merlin has been known to resort to the mean practice of taking a grouse cheeper unawares on the ground, and this is certainly an instance of a noble character degraded. On the other hand, I have seen the merlin single out a starling from a flock in the autumn and follow it probably for miles, the starling proving an equal match as regards speed of flight.

Striding over the leagues of heather one day with Jeddle, we observed a merlin rise from a rock, scout a good area of ground from above, and return to its post. From this same area presently rose a young grouse as we attempted to get within gunshot of the merlin. We saw the latter bird's wings raised and neck outstretched. Gaining, in my mind, some redemption of its character, the predatory creature gave her intended quarry what looked like a good sporting start, and then made hot pursuit, which lasted for fully a mile in a straight line. While Jeddle uttered maledictions enough for two men the merlin overtook the grouse on the moorland plateau within sight. It was struck down, and the merlin picked up her prize and flew away with it. Wading through the scratchy heather "birns," we traced them both to the bare top of an ancient British tumulus or burial ground, whose sides were covered with scrubby ling. Half an hour after the kill we found that the poor grouse had been torn to pieces and devoured on this elevated little table, around it being strewn many recent feathers, bones, entrails, &c. Here I traced remains of meadow-pipits and twites, as well as what appeared to be ejectmentia of the fluffy wings of eggar moths and elytra of beetles, as well as of cockchafers.

Although not addicted to photographic "nest-poking," my curiosity as to a merlin's nest has been satisfied. Jeddle and I lit on one on the rocky, bracken-covered slope of a moor a good height above the beck.

It was a mere depression or scratch-out partly filled with heather "birns" and dried grass. I learnt that the merlin's common name of "stone falcon" was derived from this bird's habit of watching for prey from some overtopping rock often far enough away from the nest, or even when it had no nest. We took three bluish eggs blotched with the deep reddish-brown before the full complement of four to the clutch was made up. Jeddle's triumph culminated in his shooting the falconette, the female bird—which is slightly larger than the tiercel, or male—a day or two later, but I was not then present. It would certainly be interesting to know if the escaped tiercel found another partner shortly afterwards, for certain it is that we took a full clutch of eggs out of the same nest about a month later.

The female proved an exceedingly close sitter, and was nearly trodden upon, whereas the male seemed to menace us with shrill cries whilst flying about as we approached the spot. Personally, I am sorry to report that Jeddle got both these birds, and did not fail to secure his employer's approbation. The hen he shot on the ground close to the nest; the cock he took on a tumulus—a mere pimple on the tableland of moor—half a mile off, cruelly, I thought, but without penalising himself under statutory law as regards the banned pole-trap and its allies.

We treated this bird in a surgeon-like manner; he was even reduced to a degree of tractability in confinement. There seemed a possibility of turning him to account for flying at skylarks if one cared to spend time over his training. However, he made good his escape one day, and returned, presumably, to the wild life which would doubtless prove more agreeable to him.

The Golden Eagle (*Aquila Chrysaeta*).

THE pride and the pest of the parish" are words that have been applied to this type of nobility and majesty, amongst birds, in many a Scottish village. True it is that in days long past its pilfering instincts were more noticeable, because eagles were much more numerous than now.

In ancient mythology, and indeed in Eastern lands to-day, the natives glory in the eagle's plume as the most distinguished head-dress; in fact, in India it is as indispensable as the badge of the Highland chieftain; and if, by the trammels of system we are forced to place him in a less honourable position, yet, when met with on his native mountains, free and uncontrolled, one cannot refuse the tribute which has undoubtedly been rendered to him by chroniclers of old.

In England and the Lowlands of Scotland the Golden Eagle is accounted rare, very few districts of the former country being adapted to its disposition, or suitable for breeding-places. Isolated haunts may be mentioned, for instance, parts of Derbyshire, Wales, Cumberland, and Westmoreland, at one time boasted of them.

"The Scottish border claimed several pairs, but their breeding-places were rarely discovered. It is not until we really enter the Highlands of Scotland proper, by one of the grand and romantic passes, that this noble bird can be said occasionally to occur," says a writer.

The species must be surely rapidly decreasing, for in consequence of the depredations committed amongst the

flocks in the lambing season, every device is employed, and expense incurred in the shape of rewards for their destruction.

It is recorded that from March, 1831, for a space of three years, in the county of Sutherland alone, one hundred and seventy-one old birds, with fifty-three young and eggs, were destroyed, which, while it is a standing proof that the bird is not of that extreme rarity which is sometimes supposed, it, at the same time, tells us that whilst the war of extermination goes on we shall look in vain for this appropriate ornamentation of our northern landscape.

The eyrie of this magnificent and lordly bird is usually placed on the face of some stupendous cliff situated somewhat inland; the nest is built on what might be termed a projecting shelf, or on the stump of a tree that emanates from the rock, generally in a situation perfectly inaccessible without artificial means, and often out of the reach of shot either from below or from the summit of the precipice. It is composed usually of dead vegetable matter, entangled strongly together, and in abundance, but without any lining on the inside; the eggs are two in number, of a white colour, with pale brown or purplish blotches, most numerous and largest at the thicker end.

During the season of incubation a fabulous quantity of food is procured, so much so that it is almost incredible; it is composed of nearly all the inhabitants of the wild districts called forests, but in many cases these tracts are entirely treeless. Hares, lambs, young deer, roebuck, grouse, black game, ptarmigan, curlews, plover, &c., &c.

Somewhat similar to the male eider, the plumage does not reach its limit of grandeur till close upon the fourth year, in a wild bird, and in captivity it takes longer for it to develop its distinctive markings.

Its generic markings in adult birds is as follows: Deep and rich umber brown, glossed with purple on the back and wings; on the hind part of the head and neck the feathers are hackled and pale orange-brown, occasionally edged with a somewhat paler tint, and when reflected by

the sun's rays they have a brilliant, almost golden appearance, hence its sobriquet. Thighs and shoulders of the same pale orange brown. Quills, blackish-brown; inner webs clouded with greyish-black. The secondaries are clouded with brown, light brown, and umber brown. Tail nearly square.

THE PASSING OF THE GOLDEN EAGLE FROM SCOTLAND.

His Grace the Duke of Sutherland has formed an excellent museum at Dunrobin Castle. The museum, situated in the pleasure grounds, near the castle, is admirably fitted up, and contains a most interesting collection. The antiquities, especially the relics of the ancient Picts, are well worthy of notice, but to the naturalist the collection of birds is of the highest interest.


In this museum one finds specimens of nearly all the avo-fauna of Scotland. Some, however, are fast disappearing before the guns and traps of poachers and others.

Among the native Scottish birds the eagle is by far the most noble, and it is deplorable that this species is gradually getting scarce. The brilliance of its eyes as it poses watching the approach of an enemy, and its general attitude admirably realises the following passage culled from the book called "Highland Sports," by Mr. S. John:—

"How picturesque he looks, and how perfectly he represents the genus loci as, perched on some rocky point or withered tree, he sits unconcerned in wind and storm, motionless and statue-like, with his keen, stern eye, however, intently following every movement of the shepherd or the sportsman, who, deceived by his apparent disregard, attempts to creep within rifle-shot! Long before he can reckon on reaching so far with his bullet the bird launches himself into the air, and, gradually sweeping upwards,

wheels high out of shot, leaving his enemy disappointed and vexed at having crept in vain through bog and over rock in expectation of carrying home so glorious a trophy of his skill."

The measurements of an eagle of average size are as follow :—Length from tip of beak to end of tail, 35in.; from the surface of the rock on which he sits to top of head, 20in.; width of partially expanded tail, 15in.; length of wing from shoulder to end of flight feathers, 24in.



The eagle is admirably adapted to perform the duties assigned to him. The anatomy of the eye alone is a perfect study, and this wonderful organ has a power of vision of which men have not the slightest idea, even though our sight might be aided by a telescope. The brain is large and well developed, the convolutions of grey matter dipped deep down into the white matter, thus showing a considerable amount of intelligence in the bird. The lens of the eye is very peculiar; it is flattened on each side and as brilliant as a diamond. A fish's lens is round. It is commonly believed that the eagle has a muscular apparatus connected with his eye, by means of which he can convert it, as it were, into a telescope for seeing long distances, and can so adapt his powers of vision as to see clearly at shorter distances. He must, indeed, have the most perfect organs of sight of any created thing. When he is soaring so high in the air that he can hardly be seen by the human eye it is said that he can easily detect a hare or a lamb on the ground.

The appearance of the bird in high air is very interesting, and its average height is such as to make it appear as merely a swallow. That eagles usually hunt for prey in couples is well known, and it is observed that they invariably describe the figure of eight in their peculiarly graceful curves, whilst their general motion in flight is elegance itself. It is also noticed how one flap of the wing serves to carry the bird on for many minutes without any more exertion on his part. The great power of the eagle is concentrated in the hind claw. When the bird strikes his

prey he does so from above. Charging downwards with immense velocity, he drives his hind claw into the body of his victim. The talon at the end of the hind toe usually measures two inches, and the point is as sharp as a needle. This formidable weapon would drive the body of the prey seized directly into the grasp of the three talons which form the front of the foot. Thus we have a grasping machine combining the essentials of strength and lightness.

In Scotland there is a general belief that the bird feeds largely on grouse. It is quite certain that they will eat such food, but it must be borne in mind that the bird would catch diseased and sickly grouse, and thus go far to stamp out the grouse disease. Their chief food is undoubtedly blue hares. By destroying the eagles, therefore, one might venture to say that the Scotch proprietors are acting unwisely, for surely the loss of a few grouse and hares is not too great a payment to the eagle for the good he otherwise brings about by his gratuitous exertions.

The Swallow (*Hirundo Rustica*).

THERE is no doubt but that this bird creates as much, or more, interest as any of the spring migrants, for from the oldest naturalist to the child his visit is eagerly anticipated year by year, and so he may justly be regarded as a favourite among birds.

"The swallow knoweth the time of her coming" has grown to be a homely expression, and it is very remarkable in this connection to notice the punctuality of the yearly visit, whilst the date of departure, it has been observed, varies considerably with the weather and meteorological conditions. Its arrival in April is watched and hailed as the forerunner or precursor of summer, though one often hears the phrase "one swallow does not make a summer."

It is true that in this country, and throughout Europe more or less, it is the constant attendant on cultivation, and makes use of the artificial structures of man as retreats for both shelter and breeding. Ornithologists do not, in any age, particularly specify any definite breeding station for this bird. Farm out-houses and sheds, inside and out, are the usual places for the disposition of the nest, which is usually composed of clay and strengthened with straws or small roots, lined with feathers and open at the top. Ruined coal-pits and disused barns are also resorts during the season of incubation. In open country, fissures of rocks or caves. So regular are they in their habits that it is noticed that the same pair will continue year by year to occupy the same site for its architectural nest construction.

I have seen in early October, on the south coast of England, hundreds of these interesting creatures posted on the roof of a certain hotel awaiting their mates to perform the return journey. In a space of two or three

hours the roof has been suddenly deserted, and the swallows have winged their flight seawards. Observations of this kind rather confirm the theory that swallows in a body migrate southward to a warmer clime, and refutes the somewhat fantastical idea that they bury themselves in the soil, or remain in a torpid state in our own land, during the winter.

Now to its generic markings. The adult male has the head and upper parts deep steel blue, running into a black band; the fore part of the head and throat deep chestnut; the belly and feet of a reddish-white, tinged with brown; a large white spot on the inner webs of most of the feathers; the outer feathers narrowing towards the ends. The coloration of the female is more sombre, and the forehead shows a darker chestnut. There are instances of pure white coloration throughout. When in search of commissariat they hunt in small colonies, and are most easily discernible by their flight.

THE PASSING OF THE SWALLOW.

The question whether this bird in its species or family does really leave this country in the fall of the year, has exercised the minds of naturalists in every age, and from time immemorial, and it would be well to weigh the pros and cons as to the truth. The task is a big one, inasmuch as the mind and observations of mortal man are infinitely inferior to so gigantic a work as finding out Nature, that is, God. The more one probes into the whys and wherefores of the laws of Nature the more insignificant does the created being feel himself before the Maker of all.

In this connection, however, it would be well to scan superficially the opinions expressed from time to time, and probably some who peruse these lines may be inclined to offer suggestions, as in the recent literary debate which my notes on "Can fishes hear?" produced.

Observers, past and present, are divided in opinion on this very interesting subject. The regular appearance and disappearance of some species of birds excited the curiosity of observers in all ages, and led to many conjectures respecting its causes.

It was long alleged and believed that swallows, instead of removing to warmer climates, lie concealed in fissures of rocks, in sand-banks, in the holes of decayed trees, and even at the bottom of the water in ponds, remaining during the winter in a torpid state.

"It is certain," said the Dutch naturalist Jonston, "that in hollow trees, lying many close together, they preserve themselves by mutual heat."

"In certain woods of Upper Germany," said another authority, "upon cutting up a rotten oak tree it was found full of swallows."

Unfortunately for the credibility of such accounts, however, they all wear the aspect of fanciful conjecture, rather than of a fact actually observed; and though there are accounts of similar circumstances purporting to be from actual observation, they all appear suspicious when strictly investigated.

In our own county of Northumberland it has been reported more than once, notably on the authority of the late Lord Belhaven, "that numbers of swallows have been found in old dry walls and in sandhills at Morpeth, and also near his late lordship's seat in East Lothian; not once only, but from year to year, and that when they were exposed to the warmth of a fire they revived."

Etmuller, Professor of Botany and Anatomy at Leipsic, gives his testimony thus:—"I remember," he said, "to have found more than a bushel measure would hold of swallows closely clustered among the reeds of a fish pond under the ice, all of them in appearance dead, but the heart still pulsating." Against this I place the experience of no less an authority than the late John Hunter.

"I have dissected many swallows, but found nothing in

them different from other birds as to the organs of respiration. More than this, all the animals dissected by me, of the class that sleep during winter, such as lizards, frogs, &c., had a very different conformation as to these organs. But I am firmly of opinion that terrestrial animals cannot remain any long time under water without drowning."

Independently of the established principles of physiology, the matter has been experimentally tried, and it has been found that swallows kept under water, with all due precautions, die in a few minutes.

A no less fanciful, but, as it appears to many, a more defensible opinion, was published in a scarce tract, purporting to be written by "A Person of Learning and Piety," who maintained with no little ingenuity that our migratory birds retire to the moon. He thinks that they are about two months in passing thither, and that after they are arrived above the lower regions of the air into the thin æther, they will have no occasion for food, as it will not be so apt to prey upon the spirits as our lower air.

Even on our earth, he argues, bears will live upon their fat all the winter; and hence these birds, being very succulent and sanguine, may have their provisions laid up in their bodies for the voyage; or perhaps they are thrown into a state of somnolency by the motion arising from the mutual attraction of the earth and moon.

There is a preponderating list of eminent naturalists who favour the idea that swallows migrate, and the gist of their remarks may be very briefly summed up. "Birds certainly leave our country. Without disputing that difference of temperature and nourishment have much to do with it, they are inclined to consider, that habit is quite as much concerned; according to them the recollection of the old ones, that they have made the journey, carrying the young with them, and the "instinct of travel," which, at certain periods, affects them with a real nostalgia, must be considered, especially the last, as the principal and immediately exciting cause of these migrations. Birds of passage, too, always migrate with a contrary wind, which

instead of frustrating, really eases and raises them in their flight.

The late famous M. Brehm puts it thus: "Every bird has its native country, where it freely reproduces, and remains part of the year, travelling in the remainder. Most birds spend half of the time at their home, and pass the other half in travelling. Some, particularly birds of prey, travel by day; but by far the greater part go by night; and some perform their migrations indifferently either by day or night. They seem to pass the whole of their migration without sleep, for they employ the day in seeking for food, stopping in the places where they are most likely to find it. They commonly keep very high in the air, and always at nearly the same distance from the earth, so that they rise very high over mountains, and fly lower along valleys.

The North Sea Seals.

DURING one of my coastal rambles a few days ago on Holy Island I came upon the carcase of an animal which is termed by the native fishermen "a baby seal." To the uninitiated it would seem ambiguous to apply such nomenclature to an animal weighing seven stone.

This species, however, is totally distinct from the animal which produces the skin of commercial value, found in the Arctic regions.

This bigger type of seal breeds on many of our northern islands—Orkney, Shetland, Faroe, and Farne; and of the latter group the Brownsman is singled out as the chief breeding place. At one time the animal bred freely on Holy Island, and there is still a particular part of the coast known as the "seal bat."

I learned that another baby seal had been washed ashore the following day on what is known as St. Cuthbert's Island, and this animal was the opposite in colour to the white one which I discovered, and of equal weight, and came ashore at flood tide; and upon inquiry of the sportsman who despatched it, I learned that it had been shot some ten days previously. He had taken a range of a hundred yards with a rifle, and it is interesting to note the bullet mark on the back of the head in both cases.

Naturalists and sportsmen are doubtless aware of the fact that it is next to impossible to shoot a seal in the face, on account of its rapid movements in the water the moment it perceives danger. The only method, therefore, is to await the opportunity for the animal to divert its course.

That these pests do considerable damage to the salmon

fishery along the north-east coast we have abundant proof, and scarcely a season passes but there is evidence of destruction both to fish and fishing-gear.

Until quite recently the Fishery Board generously awarded the sum of fifteen shillings to anyone producing the tail of a seal as an evidence of capture, the idea being to bring about its extermination.

As to the bulk of this species of sea-urchin, it will be well to state that I have seen the carcase of one lying upon the shore weighing twenty-five stone, which I found was killed by a shore prowler close to the column of stone called the Emmanuel Head in 1908. This animal had crept on to the beach, at high water, to sleep, and it was easily captured. Another was killed near the Castle Point weighing close upon fifty stone; and a still more colossal specimen was found by the Goswick salmon-fishers, three years or so ago, which turned the scale at seventy stone.

I have often expressed surprise that the fishermen do not turn these "finds" to account by extracting the oil, which, after a process of refinement, is invaluable as dressing for boots and articles made of leather generally—a practice adopted by their comrades in the Shetlands, where it is sold at three shillings and sixpence per quart.

The skins, which can be procured for the modest half-crown, are practically worthless, save as mats.

The writer on one occasion observed the depredations of one of these monsters amongst the fish, the havoc wrought being prodigious and almost incredible.

SEAL HUNTING IN GREENLAND.

Greenland is without a doubt prolific in seal production. There are at least four species of this animal inhabiting the Greenland coast-line, the species called "harp," or "saddle-back," being by far the most numerous. These seals congregate in large herds, and

very early in March come from the north to the place appointed for bringing forth and rearing the young brood. They have apparently a wonderful instinct in doing this, following each other in droves for days, all steering a course to their chosen breeding-place. The young are generally produced from March 16 to 22. They are beautiful little creatures, with long, soft, yellow fur, which Nature endows them with to keep them warm during their short infancy, and so rapid is the growth of the young that if the weather is good and they are left undisturbed a marked difference in their size and condition can be noticed day by day. By the middle of April the old ones have left their young to take care of themselves. The young ones at this time begin to cast the fur for the beautiful smooth, spotted coat, which they retain until the third year, when they become full-grown.

The next in importance to the "saddle-back" is the "bladder-nose," or "hooded seal," so called from having a loose bag hanging over the nose of the male. The animal has the power of inflating this bladder-like appendage at will, and it invariably does so when enraged. This seal is double the size of the "saddle-back," and, besides being coal-black in colour, it is spotted very much akin to the leopard. It is recorded that before the rifle came so much into use the old "bladder-nose" was held in deep respect. Many a time a boat's crew have had to beat a hasty retreat off the ice and into the boat after having had their seal-clubs snatched from their grasp by this powerful animal. One peculiarity about this species is that the females are only about half the size of the males. They are also more irregular in their breeding habits than the "saddle-back," and, strange to say, the young ones cast their fur before birth, and it is found lying beside the young in round balls. They are always most numerous near the "saddle-backs," but are seldom seen amongst them.

The next is the "ground," or "bearded," seal, so named from being always near the land, and from its magnificent

white beard. In coloration it is a dull brown, and it is the heaviest of the seal tribe. Its food consists mostly of prawns.

The fourth and smallest species is the "floe" seal, or its nickname, "floe-rat," the ordinary nomenclature of sailors. They presumably get their name from the habit of always lying on the field ice, and having holes ready to pop into when alarmed. Their great enemy is the Polar bear, for they are his principal food. The "floe" seal is a remarkably pretty little animal. Its hair is short, with grey, irregular stripes down the back.

In the capture of these animals the "modus operandi" is for the ships to cruise along the coast margin, following the well-known rule that if it lies to the eastward of the meridian of Greenwich in lat. 73, deg. N., the seals will be found to the north of the Island of Jan Mayen, but if it is much to the west of this line the seals will be to the south and west of the island, for well-known reasons. Having ascertained this, the longitude of the pack is first ascertained before starting to look for the seals. This being found, the ice is taken and the ships forced through the pack under steam and canvas, very frequently receiving severe shocks and sometimes getting their bows stove in. Every effort must now be used to force the ships through the ice in the desired direction. All hands had often to be on deck to roll the ship from side to side to break the ice down, heaving at windlass and capstan, on stout hawsers attached to the ice, using ice-saws to cut, and powder to blast a passage.

Some years ago a pack of seals would have extended in every direction as far as could be seen with a good telescope from a ship's mast-head, and lying as close as a flock of sheep, their reflection darkening the sky above them. In those days a ship, falling in amongst them about April 1, had no difficulty in getting as many as she could hold. The case is greatly altered now; a pack very rarely exceeds a twentieth part of the above size, owing to the cruel manner in which they have been destroyed.

On the seals being reached, the men are sent over the ice, the harpooners armed with rifles, the other men with seal-clubs, knives, &c., also a rope to drag the skins to the ship, which are allowed to lie on deck till cold, and then put into the tanks. And now a work of brutal murder and cruelty goes on enough to make the hardest-hearted turn away with loathing and disgust. The harpooner chooses a place where a number of young seals are lying, knowing well that the mothers will soon make their appearance to see if the young are safe, and then shoot them without mercy. This sort of work goes on for a few days, until tens of thousands of young ones are left motherless to die of starvation, not so much from the number of old ones killed—although too many of them are slain at this season, forty thousand being killed one year in March—as from those wounded and scared away. In a short time the old ones become shy, and will not come near where men are standing, but keep at a respectable distance. It is truly horrible to note the young ones in their endeavour to suck the carcasses of their mothers, their eyes starting out of the sockets, looking the very picture of famine. They crawl over and over them until quite red with blood, poking them with their noses, no doubt at the same time wondering why their usual source does not supply food. Their cries are truly painful, and the din dreadful in the extreme. These motherless seals collect into lots of five and six and crawl about the ice, their heads fast becoming the biggest parts of their bodies, searching, no doubt, to find the nourishment they stand so much in need of.

In Labrador there is a close time for the seals, which are not allowed to be interfered with until the time that the mothers are leaving their young. The females are very affectionate towards their young. It is very amusing to watch an old one coming on to a piece of ice, where there are ten or a dozen young ones, going from one to another until she finds her own, kissing and patting it and teaching it how to feed. But any of the others had better not venture near. If they do the old seal will stretch out her

neck, give an angry "wurr," fly at them, and scratch them with her sharp claws, making the fur fly. At other times, seeing men approaching, a mother will occasionally snatch up her young one, dive under the ice with it, and carry it for the time out of the reach of danger. The male seals, on the other hand, never lose an opportunity of worrying the young, taking them in their teeth and shaking them as a terrier will a rat.

Speaking of the Arctic seals, may I digress somewhat, if I have not already trespassed from the subject of birds too long, by quoting the substance of a report which an Arctic traveller made upon the folklore of the Faroe Isles, in relation to seals:—

Anyone versed in natural history will know that Iceland and the Faroe Islands abound with seals—so much so that in the folklore of these localities legends are common connecting the human race with the animals thus:—

Seals have their origin in human beings who of their own free will have drowned themselves in the sea. Once a year—on Twelfth Night—they slip off their skins and amuse themselves like men and women in dancing and other pleasures in the caves of the rocks and the big hollows of the beach. A young man in the village of Mygledahl, in Kalsoe, had heard talk of this conduct of the seals, and a place in the neighbourhood of the village was pointed out to him where they were said to assemble on Twelfth Night. In the evening of that day he stole away thither and concealed himself. Soon he saw a vast multitude of seals come swimming towards the place, cast off their skins, and lie down upon the rocks. He noticed that a very fair and beautiful girl came out of one of the sealskins and lay down not far from where he was hidden. Then he crept towards her and took her in his arms. The man and the seal-girl danced together throughout the whole of the night, but when day began to break every seal went in search of its skin. The seal-girl alone was unsuccessful in the search, but she tracked it by its smell

to the Mygledahl-man, and when he, in spite of her entreaties, would not give it back to her, she was forced to follow him to Mygledahl. There they lived together for many years, and many children were born to them, but the man had to be perpetually on the watch, lest his wife should be able to lay hands on her sealskin, which, accordingly, he kept locked in the bottom of his chest, the key of which was always about his person. One day, however, he was out fishing, when he remembered that he had left the key at home. He called out sorrowfully to his fisher-mates: "This day I shall lose my wife." They pulled up their lines and rowed home quickly, but when they came to the house the woman had disappeared, and only the children were at home. That no harm might come to them when she left them, their mother had extinguished the fire on the hearth and put the knives out of sight. In the meantime she had run down to the beach, attired herself in her sealskin, and directed her course to the sea, where another seal, who had formerly been her lover, came at once to her side. This animal had been lying outside the village all these years waiting for her. After that, when the children of the Mygledahl-man used to go down to the beach, they often saw a seal lift its head above the water and look towards the land. This seal was supposed to be the mother of the children. A long time passed away, and again it chanced that the Mygledahl-man was about to hunt the seals in a big rock-hole. The night before this was to happen the man dreamed his lost wife came to him and said that if he went seal-hunting in that cave he must take care not to kill a large seal which stood in front of the cave, because that was her mate, and the two young seals in the heart of the cave, because they were her two sons, and she informed him of the colour of their skins. But the man took no heed of his dream, went away after the seals, and killed all he could lay hands upon. The spoil was divided when they got home, and the man received for his share the whole of the large male seal and the hands and feet of the two young seals. That

same evening they had cooked the head and paws of the large seal for supper, and the meat was put up in a trough, when a loud crash was heard in the kitchen. The man returned thither and saw a frightful witch, who sniffed at the trough and cried: "Here lie the head with the upstanding nose of a man, the hand of Haarek, and the foot of Frederick. Revenged they are and revenged they shall be on the men of Mygledahl, some of whom shall perish by sea, and others fall down from the rocks, until the number of the slain shall be so great that by holding each other's hands they may gird all Kalsoe." Having said this she vanished. Many Mygledahl-men soon afterwards came to a violent end. Some were drowned in the sea by Kalsoe while fishing, others fell from the rocks while catching seafowl. The number of the dead, however, has never encircled the island, which is ten miles long by one and a-half wide.

Here is another legend of the Faroe Islands:—If you would be rich you must go out on Twelfth Night to a cross-road where five ways meet, one of which leads to a church, and you must take with you in your hands a grey calfskin and an axe. When you reach the cross-road you must sit down on the calfskin, the tail of which must be extended in the direction of the road which leads to the churchyard. Then you look fixedly at the axe, which must be made as sharp as possible. Towards midnight the goblins will come in multitudes and put gold in great heaps around you to try and make you look up, and they will chatter, grimace, and grin at you. But when at length they have failed in causing you to look aside, they will begin to take hold of the tail of the calfskin and drag it away, with you upon it. Then you will be fortunate if you can succeed in cutting off the tail without damaging the axe. If you succeed, the goblins will vanish, and all the gold will remain by you.

The following is also believed in by the inhabitants of those islands:—The "lucky stone" is a good thing to possess, because the man who has it is always fortunate

and victorious in every struggle, nor can any man or evil spirit harm him. Success follows him wherever he goes, everything happens according to his wishes, and he is everyone's favourite. It is not wonderful, therefore, that men will bargain for a stone that can work so much good for its owner. Only the raven, however, knows where to find it. It is a common saying that this bird mates in February, lays eggs in March, and hatches in April. Now, when the raven has laid its eggs, the man who determines to have the lucky stone must climb the rock whereon the raven has its nest. There he must secrete himself until the bird flies from the nest. Immediately the man must hasten to the nest, take the eggs therefrom, go away and boil them hard, and then lay them in the nest again, so that the raven, when it comes back, may not notice anything amiss. Then the bird resumes its attempt to hatch them. When the time for incubation, however, is past, it will fly off to bring the lucky stone to place beside the eggs in the nest. Now the man must do his best to shoot the bird, take the stone from its beak, and go home with it. His fortune is thus made.

Conclusion.

THE object constantly kept in view in penning the foregoing catalogue of the migratory tribes, which visit these shores, has been one of service to many of my wild fowling friends, true sportsmen in every sense, who come here, year by year. I am conscious of many shortcomings in fixing the more exact haunts from which many birds emanate and breed. If the able and experienced chroniclers of the migrants in the past have written craving the indulgence of the reader, I feel I am infinitely more in need of such indulgence, and as man is but mortal, and his best work is oft-times a sorry attempt, I am quite content if my numerous readers will regard the foregoing pages, which, in my leisure I have somewhat hastily penned, simply as a guide.

THE AUTHOR.

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